If the Cap Fits

Reform of European Climate Policy and the EU Emissions Trading System

Simon Moore
Edited by Guy Newey

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Policy Exchange

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In February 2013 Policy Exchange hosted a Roundtable forum to contribute to the research for this report, which is referred to at relevant points. The Roundtable was conducted under the Chatham House Rule, so individual speakers are not identified.

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Executive Summary

The European Emissions Trading System is "working like it's supposed to".
David Roberts, 26th April 2013.[1]

The European Emissions Trading System has "died".
George Monbiot, 22nd April 2013.[2]

These polar opposite assessments from environmental commentators (who otherwise agree on the importance of long-term climate policy objectives) underline the chaotic debate around the European Emissions Trading System (ETS). This report aims to assess the current health of the ETS and recommend ways to strengthen it, as well as improving wider European climate and energy policy.

A variety of problems have weakened the ETS, originally conceived as the backbone of European climate policy. Some of them were unavoidable, such as the effects of the financial crisis on European economies. Others have been self-inflicted, such as the adoption of renewable energy targets and the overuse of offsetting projects of dubious environmental merit. At the same time, protracted haggling over an imperfect short-term fix, known as backloading, have given the impression that the ETS is in chaos.

Yet the ETS is also accomplishing its most important role– to keep emissions below the agreed cap. It has achieved the significant accomplishment of getting a group of more than 25 disparate countries to make a joint commitment to reducing a pollutant in a move that is likely to increase the cost of one of the bedrocks of a successful economy – energy. It has created a single, continent-wide carbon price which has broad acceptance in the industrial, financial, and government sectors.

In March 2013, the European Commission released its Green Paper to consider the next steps for the ETS, as well as to assess broader questions about the future of European energy and climate policy. This includes whether there should be a new 2030 energy and climate 'package' that includes targets for carbon, renewable energy and energy efficiency. The review offers the opportunity for officials to look beyond the temporary patching-up that has characterised some of the ETS reform proposals since the 2020 package was agreed and to look more strategically at how the ETS functions currently and how it fits with other parts of EU energy and climate policy.

This report examines options for long-term structural reform, highlighting ways to strengthen the ETS to ensure further emissions reductions can be achieved as cost-effectively as possible.

Stronger, longer-term

Setting the cap level is the single most important decision in any cap-and-trade system. The level and duration of the cap determine the environmental effectiveness of the policy, while the cost of carbon abatement is a consequence of the stringency

1 (Roberts, 2013)

2 (Monbiot, 2013)

and length of the cap. It is therefore logical that the principle focus for ETS reform should be the cap: the level it is set at, the length of time it is set for and whether it will be amendable in the future. Importantly, using the carbon price as a proxy for the health of the ETS will lead to the wrong policy conclusions.

Setting the 'right' level for the ETS cap is a complex task. Negotiations about the cap take in a range of factors: environmental benefits, the expected level and distribution of decarbonisation costs, impacts on global negotiations, and others. The current cap is set to reduce by 1.74% a year, until at latest 2025 when it has to be reviewed. This will result in a 21% cut in emissions from the traded sector by 2020. This has turned out to be a decidedly modest level of ambition. The effects of recession, combined with other weaknesses in design, has left such slack that tens of GW of new coal generation around Europe (8.4 GW in Germany alone) can be seriously considered by their builders, who do not envisage the cap constraining their profitability.

This research analyses the different degrees of ambition inherent in some EU proposals. The figures are indicative, but present a useful basis for comparison. The relative ambition of these scenarios can be seen in Figure ES1. The EU has stated in its 2050 Roadmap that it hopes to achieve 80–95% reductions in emissions by 2050, in line with its assessment of Europe's 'fair share' of global emissions cut aimed at giving a 50% chance of limiting average global warming to 2°. The current rate of ETS reduction would fail to meet that target, leading to a 70% cut by 2050, meaning it is significantly lower than the EU's stated ambitions for 2050. Scenarios which most closely correspond to the EU's stated ambition for 2050 suggest a 45–50% target for 2030 (or around 55% for 2035, see below).

Figure ES1: Decarbonisation scenarios – comparing ambition rates

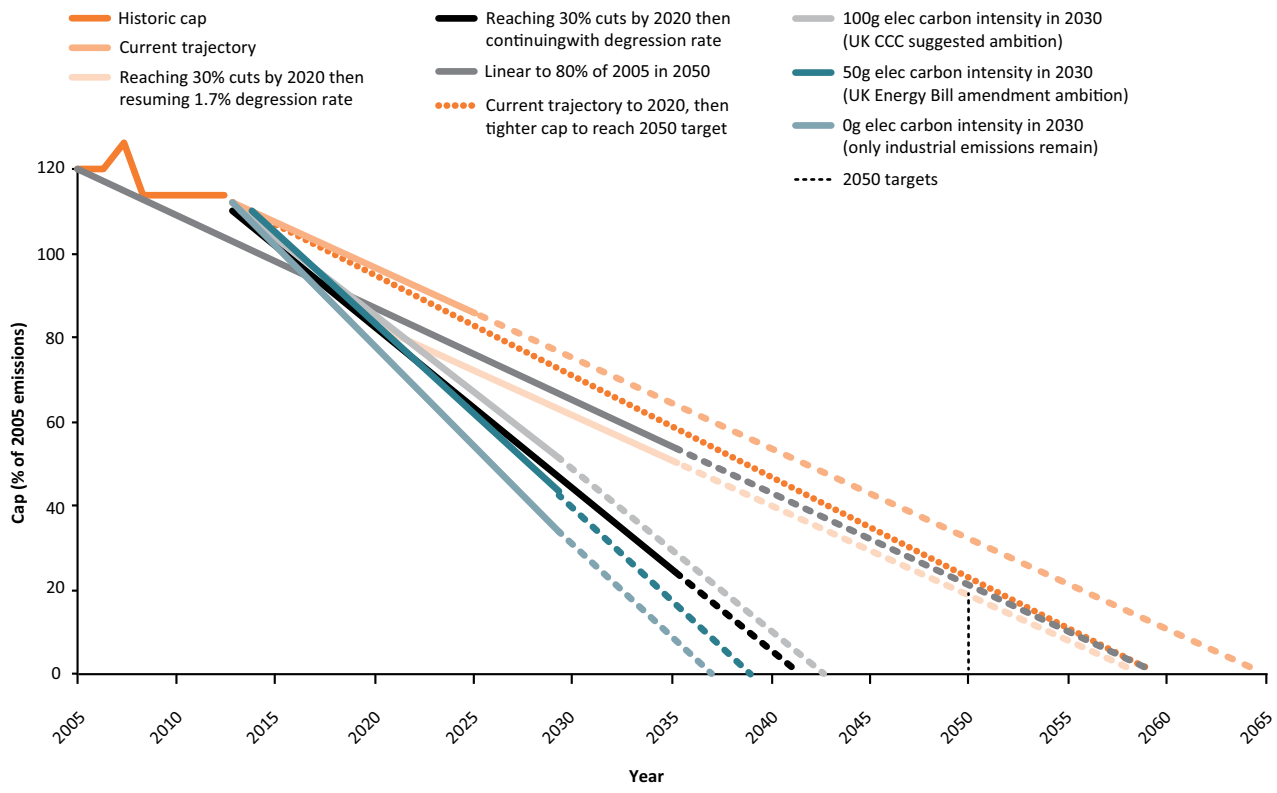
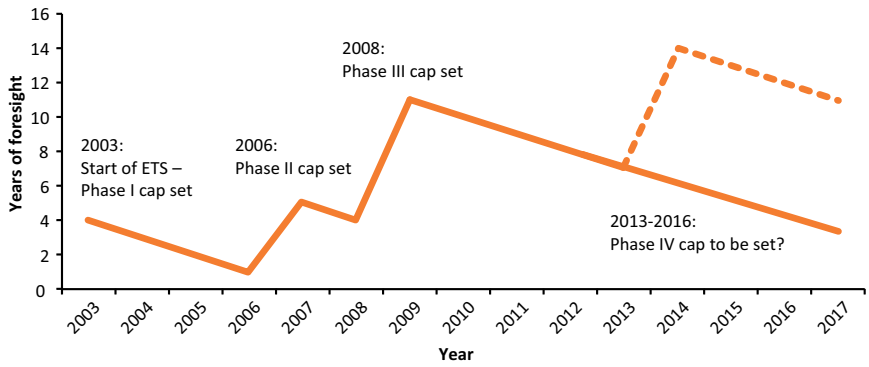


Figure ES1 shows that:

1. The ETS with its current cap (and linear reduction factor, if it were continued past 2025) is relatively modest compared with other statements of EU climate ambition, such as the 2050 Roadmap.
2. The changes needed to meet targets for 2050, either by reducing the number of permits immediately, through pre-2020 withdrawal of permits, or by adopting more ambition in Phase IV.
3. If the EU were to adopt policies similar to the CCC's proposed 50g or 100g targets for electricity carbon intensity, that would represent a significant increase in ambition compared both to where the ETS is now, and where it is meant to be by 2050.

The EU should ensure that the ETS cap is far more ambitious.

Figure ES2: ETS cap horizon



The current ETS rules stipulate that phases will last 8 years. There is no requirement for when any changes for a new or upcoming phase have to be agreed, but each time there has been some forewarning of what can be expected. As seen in Figure ES2, this means that from the point at which they have been agreed, ETS caps have given a maximum of 11 years of certainty, but with an average over that period of just 7 ½ years. If a new 8 year cap were agreed next year, that would give 14 years of foresight (from a decision in 2014 to the end of the cap phase in 2028).

Wind turbines have expected lifespans shorter than most other generation infrastructure, and are still expected to last 20 years. Nuclear power stations are built for 40 years or More. The ETS has never provided that length of signal. The EU is now working on a package of climate and energy targets for 2030. As part of this, officials should review whether 2030 is the appropriate date at which to aim when setting another round of targets. If it is to provide a durable enough signal to underpin major electricity generation infrastructure investments, a longer-term commitment, perhaps as far as 2035, would be more valuable.

Many countries provide additional support mechanisms for low-carbon generation, not only to meet their portion of the 2020 Renewable Energy Target but also as a response to the weakness of the ETS in providing a long-term carbon signal. In the UK, this includes the Renewables Obligation and the forthcoming Electricity Market Reform programme, which will give generators guaranteed electricity

prices far into into the future. Other countries have chosen different methods, such as feed-in tariffs (FITs). All of these programmes have in common a longer commitment of time (and of money) from governments than the ETS cap. Many also imply a much higher cost per tonne of carbon saved than seen in the ETS. This shows that governments are prepared to give longer-term signals when they feel it is necessary and they should apply the same level of ambition to the ETS signal.

Recommendation: The EU should adopt a longer-term carbon cap in Phase IV, that can offer market participants greater clarity about the future position of the carbon cap. It should aim for a cap in keeping with the duration of major energy infrastructure investments, with a minimum of 20 years foresight, at a level in keeping with the EU's climate policy objectives. This would imply, for a cap set in 2015, aiming to set a cap as far out as 2035.

Recommendation: A 2035 cap set to reduce emissions in the traded sector by approximately 55% compared to 2005 levels would be in keeping with expressed EU objectives for 2050. If EU leaders are determined to create a target for 2030 instead to be in keeping with 2050 objectives, this would need to be set to reduce emissions in the traded sector by 50% compared to 2005 levels

Managing the ETS

The trade-off inherent in decisions over the cap duration pitches certainty against the ability to respond to change. Longer caps may give greater policy foresight to investors, but they also increase the risk of events occurring that make previous decisions less appropriate. Lengthening the time horizon of the ETS will make a clear set of rules for potential amendment of the decision more desirable.

In an ideal world, the ETS would not need any intervention. Policymakers would get all the decisions they have to make in advance right. However, the current chaotic debate over backloading highlights how intervention may be desirable if assumptions on which the level of ambition depend turn out to be significantly inaccurate. A clear structure about when intervention will and will not be contemplated is a better alternative.

It sounds paradoxical to propose making something more stable by making it more changeable. But the existing structure, without systems in place for amendment, has still witnessed almost constant attempts to tweak the ETS. They have happened in a chaotic manner that is difficult to prepare for. A longer-term ETS should incorporate clear rules about when changes to the ETS cap will and will not be tolerated, and what form those changes can take. Certainty (or at least clarity) for market participants is valuable. But this cannot and will not be achieved by attempting to preserve current ETS market structures in aspic. Certainty is not much use if it is only the certainty that a broken policy will not be fixed.

Intervention in the ETS market should not occur when the system produces a result that some politicians or stakeholders do not like. In the ETS it is the cap, rather than the price, that is paramount. However, policymakers ought to be able to correct the system to bring it into line with real world experience.

Recommendation: The cap level should be able to be re-considered in cases where:

- ***Macro-economic conditions are significantly different from those expected when the cap was set.***

- *There are significant changes in international climate negotiations (for example, a more ambitious global deal or a collapse in negotiations).*
- *Scientific understanding on climate diverges significantly from what was assumed when the cap was being set.*

Re-consideration of the cap should not *take place in response to particular price levels.*

Once these criteria are established, it is useful to examine what institution should implement such changes. In recent decades, there has been an increasing move towards central bank independence as a way of trying to insulate monetary policy from political interference. Politicians, it has been argued, would tend to abuse their control of economic levers by seeking to spur economic growth in the run-up to elections, even though this may have detrimental long-term effects.

A similar situation exists in climate policy, where politicians may be reluctant to enact beneficial long-term policies because of short-term electoral fears, or to manipulate the supply of carbon permits in order to mollify industrial lobbies. Taking decisions about supply of permits out of a negotiated settlement between national ministers and into a politically independent and transparent setting could see more clarity injected into the ETS market and improve the confidence of the entities participating in it.

The slack under the current ETS cap has resulted in significant part from its inability to adjust to changing economic circumstances. The 'business as usual' case turned out to be highly inaccurate in the wake of the financial crisis. Without any straightforward means of changing course, uncertainty about how to change the cap has put its political credibility and policy utility in jeopardy. The current, highly politicised and disorderly process for intervention has been demonstrably incapable of providing clear signals. While the choice of the ETS as the means of decarbonisation is rightly a political one, reducing the role for political haggling in the operational decisions about the ETS is critical.

An independent agency, with clearly defined rules about when and how it can intervene, would provide a much better alternative. Such an agency would be better placed to navigate between the need to retain stability, give longer-term investment signals and ensure that decisions taken about its ambition keeps pace with world events.

A body with advisory powers similar to the UK Committee on Climate Change provides the best balance between independence and political feasibility. Final decisions on cap adjustment would still require member state approval. The rules governing when and how the new institution would propose changes should be robust. These trigger points for when market intervention will occur should be established *ex ante* to allow market participants to anticipate and plan for changes. The review process should operate on a clearly defined timetable. A 2 or 3 year review cycle would best strike the balance between long-term stability and responsiveness to changing circumstances.

***Recommendation:** The EU should establish a new agency to provide independent advice on cap management decisions. Rules governing conditions under which cap amendment should be considered, and establishing a regular timetable of reviews, should be specified in advance, at the same time as the agency is established. It should establish transparent procedures for releasing conclusions and minutes of meetings and setting dates for decisions in the manner of a central bank.*

Backbone, not backstop

The EU renewable energy target has undermined the ETS by mandating specific emissions reductions that the market would otherwise have had to find. It has reduced the cost-effectiveness of European climate policy, because the specific technologies they mandate are more expensive (in some cases much more expensive) than the options the market would otherwise pursue. The renewable energy target, somewhat paradoxically, has managed to lower the EU carbon price while vastly increasing the overall cost of policy to address climate change.

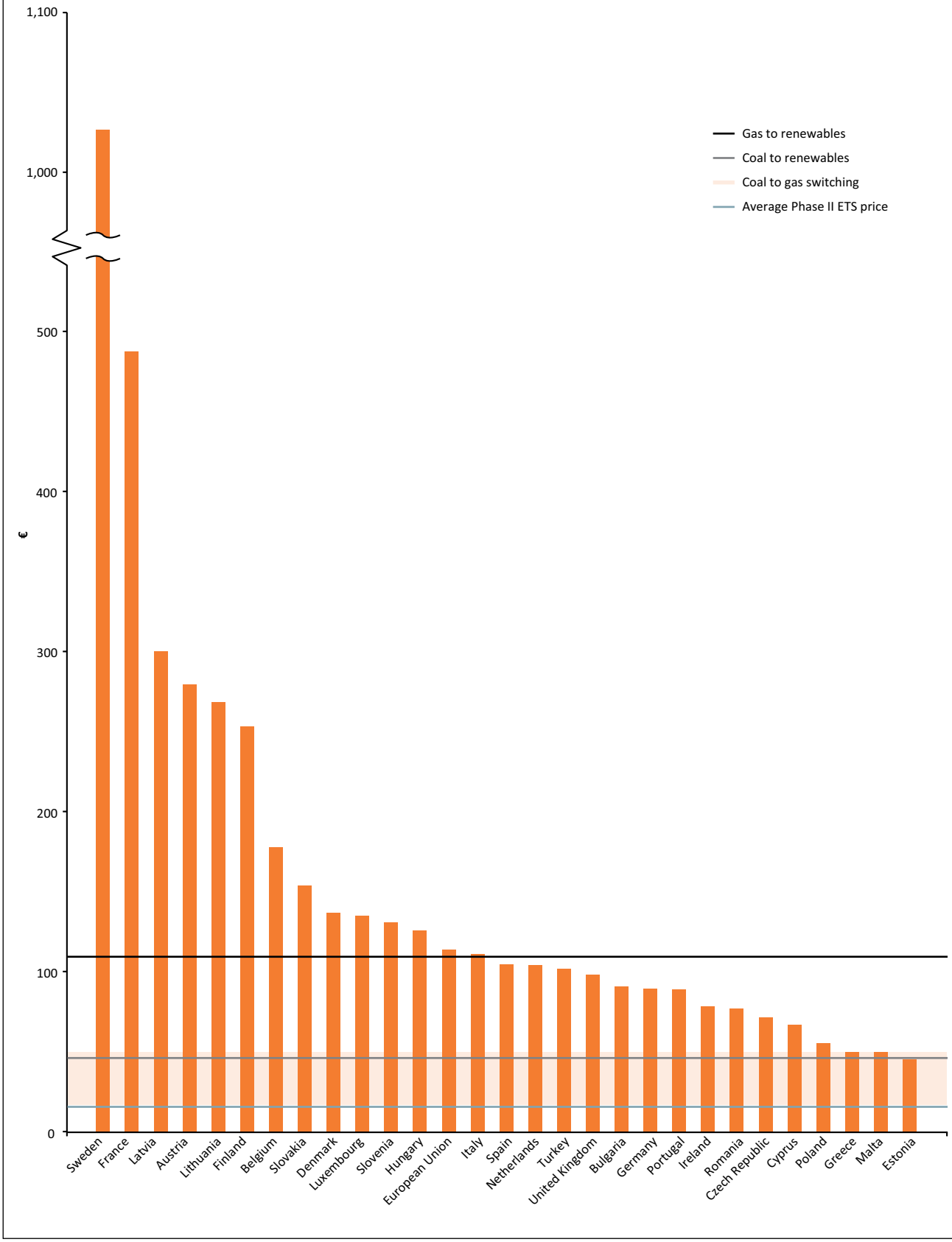
Bringing forward deployment of renewables by fiat has had the dual effect of lowering the (visible) ETS carbon price, while simultaneously forcing consumers to pay for a much higher 'hidden' carbon price-equivalent in renewable energy subsidy programmes. In such a policy ecosystem, the ETS has become the 'backstop' for other policies (renewable energy targets, national emissions performance standards, etc.), only having an effect where other policies prove insufficient, rather than being the 'backbone' carrying the main weight of decarbonisation. When the effects of the recession are combined with that of the renewable energy target and extensive offsetting, the consequence has been low ETS prices. Non-renewable energy low-cost abatement options (coal-to-gas fuel switching, efficiency) end up being pushed back in time as more expensive renewables are forced to be deployed before 2020.

The perversity of this approach is shown by an examination of the EU's original assessment of the impacts of the renewable energy target. Its modelling estimated a maximum needed renewable energy incentive of €45/MWh, which has proven to be conservative (for example, offshore wind subsidy in the UK costs two to three times that estimate; solar PV is even more expensive than that). Our calculations show that, even at this level, it implies that support for renewables is costing between €45 and €1,000 costs per tonne of carbon saved based on different European countries' average carbon intensity of electricity. In the UK, the RET would cost roughly €90 per tCO_2 saved; in nuclear-dominated France, where electricity had a small carbon footprint to begin with, it becomes an extraordinary €487 per tCO_2 saved (Figure ES3). If the new renewable generation displaces coal or gas, the figure is lower, between €45 and €110. This compares to an average Phase II price of around €16 and a current price of about €5 for a tonne of carbon saved through the ETS.

When the Renewable Energy Target was being brought in, officials thought it would require EU Member States to spend €100 (or in the most extreme case, over €1000) per tonne of CO_2 to avoid paying €49/tonne carbon price. This was a bad deal at the time, and only looks worse as the carbon price has been significantly cheaper.

Renewable energy targets have had a damaging and distorting impact on European climate policy. They have undermined the principle policy for reducing carbon while adding hefty sums to consumer bills. They have done so while making no net saving of carbon, simply substituting more expensive ways of reducing emissions for cheaper ones. The current approach is like being given £1,000 to feed as many people as possible and starting by ordering caviar. Squandering money on hugely expensive renewable energy projects is an unaffordable and wasteful luxury. There is no point choosing a policy, like the ETS, designed to find the cheapest carbon reductions, and then insist on expensive

Figure ES3: Cost per tonne of carbon saved by renewable energy target



carbon reductions through technology-specific targets which are unresponsive to the costs involved.

Recommendation: The EU should abandon its renewable energy target for 2020, and should not include a renewable energy target in any package for 2030 or beyond.

Other recommendations

- Offsetting: The EU should make continued use of offsetting contingent on improvements in the environmental performance verification process. Officials should prepare to go further in regulating the offset market should reforms to offsetting that are currently being implemented fail to produce the desired improvements in their quality and reliability.
- Expansion: The EU should continue to investigate ways that carbon pricing could be extended to sectors presently not covered by the ETS. That could entail more detailed investigation of the feasibility of applying a carbon cap to gas or transport fuel networks upstream.
- Aviation: The EU must stick to its pledge to resume enforcement of the ETS on aviation if ICAO negotiations do not yield results.
- International link-ups: The EU should continue to pursue links with other ETSs, in order to bring as much of the world's emissions under a cap as possible. However, care needs to be taken to ensure that other ETS systems provide a sufficient degree of ambition.
- Auctioning: The ETS should continue to move towards full auctioning of permits. Phase IV should achieve 100% auctioning of permits, though any possibility of speeding up this process should be pursued.
- Carbon leakage: The ETS should continue to encourage the adoption of ETS or carbon pricing policies in other countries. As part of this, the EU should use its position as a leading trading block to encourage progress on greenhouse gas emissions, for instance by linking free trade agreements covering carbon-intensive industries to substantive progress on policies to control emissions.
- Carbon taxes: At present, there are a limited number of cases in which a move to carbon taxation from emissions trading would make sense. They are:
  - If other major economies adopted tax-based policies. Currently, this does not seem likely (indeed, China is moving forward with experimental regional ETSs), but a change in the political mood in the USA or China would be important enough that Europe should be prepared to reconsider its approach.
  - If international agreements change to accounting for carbon on a consumption, rather than production, basis. If a strong consensus emerges internationally that this approach is preferable, then Europe should be willing to adapt its approach.
  - If the ETS is abandoned. In this case, a carbon tax would be preferable to command-and-control regulatory alternatives.

Political will

The reforms proposed in this report are no substitute for a political determination to tackle emissions. Countries around Europe are grappling with a difficult set

of problems: recovery from the financial crisis; the future of the Euro; helping its newest members achieve the level of economic development of the most successful Member States. Environmental concerns have to compete for attention and resources against this background. Despite this, European leaders have to show seriousness about mitigating climate risks. Bolstering the level of ambition of the ETS is a prerequisite if the refinements proposed here are to succeed. Technocratic reforms cannot be used to fool the market into thinking it is more politically sustainable than politicians have set it up to be. A Europe ambivalent about major emissions reductions will miss the targets it has set in the fields of energy and climate policy in decades to come.

1
Introduction

In the play of *Peter Pan*, the audience is asked to bring the poisoned fairy Tinkerbell back to life by demonstrating, through applause, that they do believe in fairies. In 2013, the EU appeared to be attempting a similar approach to reforming its key climate policy, the Emissions Trading System (ETS). A 'fix', known as backloading, that would have hardly any tangible effect on the ETS market was put before Members of the European Parliament, in the hope that, by showing their acclaim (through voting rather than clapping), they could revive the ETS. The Parliament voted against the proposal.

It has been a common theme in recent months to hear the ETS described as dying, if not dead. There is a real risk that such talk can become a self-fulfilling prophecy. Yet despite this the ETS is accomplishing its most important task – it has kept emissions below the agreed cap. It has achieved the significant accomplishment of getting a group of more than 25 disparate countries to make a joint commitment to reducing a pollutant in a move that is likely to increase the cost of one of the bedrocks of a successful economy, energy. This alone should be celebrated, particularly as multilateral institutions are facing considerable pressure.

Getting a carbon pricing policy right is an important step in addressing climate change. The current scientific consensus is focused on reductions in emissions of greenhouse gases to mitigate the risk of dangerous climate change. But many potential responses to climate change are expensive. A system that can identify the cheapest low carbon technologies should help to manage those costs. The cheaper the costs of decarbonisation, the more likely it is that the effort can be politically sustained (in both the UK and other countries), to deliver the challenging long-term emissions reductions required (Less, 2012). Governments have limited knowledge about the costs of cutting greenhouse gas emissions in different sectors of the economy, making a 'command-and-control' approach to greenhouse gas regulation likely to be very inefficient (Hepburn, 2006, p. 229). Rather than relying on the judgment of regulators to mandate where savings must be made, pricing carbon enables individual firms to identify where the cheapest emissions reductions can be made, and so keeps the cost of meeting a given emissions reduction objective as low as possible.

There are both policy and political problems with the ETS, but they are not the ones that the backloading proposals were designed to address. The ETS is still a crucial case study for carbon pricing worldwide; the collapse of the European system would have serious repercussions for others considering emulating the scheme. At the same time, Europe risks drastically increasing the cost of its own decarbonisation efforts if carbon pricing falls out of favour and is replaced by

even more regulatory or centrally-planned interventions. The EU and its Member States are beginning to look at the future of the ETS, as well as broader European energy and climate policy, after the existing targets expire in 2020. This report will assess the case for reforming the ETS. Its starting point is the premise that the ETS is the most important policy in Europe at present to tackle the emissions that contribute to potentially dangerous climate change. It aims to highlight ways in which the ETS can be strengthened, to better equip it to force further emissions reductions in years to come. It looks beyond current, short-term debates at options for serious long-term structural reform. These include the time and ambition of future caps, institutions for managing the ETS, the interaction of the ETS with other policy areas, the impact of the ETS on competitiveness, and the circumstances in which the cap-and-trade versus carbon tax debate ought to be reopened. These recommendations recognise the accomplishments of the ETS to date, while also accepting that further, continuing evolution will be necessary for the policy to achieve its potential.

> “A Europe ambivalent about major emissions reductions will miss the targets it has set in the fields of energy and climate policy in decades to come”

The reforms proposed in this report are no substitute for political seriousness about tackling emissions. Countries around Europe are grappling with a huge set of problems – recovery from the financial crisis, uncertainty over the future of the Euro, the ongoing process of helping its newest members catch up to the level of economic development in the most successful Member States. There is little appetite among many Member States for environmental policies that would impose significant extra burdens on European economies. Without some semblance of political agreement on what the ETS is intended to achieve in future years, the more detailed discussion about how to improve the ETS that this report focuses on will be of little assistance. To be effective, reforms need to be bolstered by political will – technocratic reforms cannot be used to fool the market into thinking it is more politically sustainable than politicians have set it up to be. A Europe ambivalent about major emissions reductions will miss the targets it has set in the fields of energy and climate policy in decades to come.

2
History of the ETS

In 2003, the European Union decided to adopt a cap-and-trade structure for its carbon pricing policy (Box 2.1). It had previously backed a carbon tax structure, but after the failure to agree a worldwide carbon pricing policy during UN negotiations, the EU changed its mind. Since it was implemented in 2005, the Emissions Trading System (EU ETS) has been the largest emissions trading system in the world.

Box 2.1: What is cap and trade?

There are two main alternative ways of pricing a pollutant (such as greenhouse gas emissions). One way is to control the pollutant by setting an enforceable limit, or cap, on the amount that can be released from a group of polluters. That cap is usually reduced over time. Polluters must acquire permits for every unit of pollution released, with the total amount of the permits available set by government (or in this case, the EU). Polluters subject to these regulations can then sell permits they do not need, or buy in permits from other firms who have been able to reduce their emissions. Prices then fluctuate according to the relative balance of supply of and demand for permits. Companies can weigh the cost of buying permits against the cost of measures to reduce emissions and so avoid the need to hold permits. A cap-and-trade (or emissions trading) system should locate the cheapest ways of cutting industrial emissions, allowing environmental objectives to be met at least cost. It also gives clarity about future emissions, allowing the market to be calibrated to give a prescribed amount of environmental benefit.

The other way is to specify the price that polluters must pay for each unit of emissions. Once the cost of polluting has been fixed, polluters can decide whether to continue with polluting activity and pay the tax, or change their operations to avoid it. The carbon tax would also usually be raised over time. Under a carbon tax system, the amount of abatement would fluctuate according to the relative costs of the tax and options for reducing emissions.

Both systems have their advocates and create a distinct set of challenges. Chapter 7 will examine the current state of that debate in detail.

The ETS governs emissions from installations with a 'net heat excess' of 20MW or more: a total of 11,000 facilities in a range of different industries. The aviation sector is in the process of being brought into the ETS (Box 4.1). In total, the capped sectors amount to around half the EU's CO_2 emissions, and 40% of its greenhouse gas emissions.

Under the ETS, emissions permits (EUAs) are released in multi-year trading periods or 'phases'. Phase I ran from January 2005 to December 2007. Phase II ran from January 2008 to December 2012. Phase III began in January 2013, and will go until December 2020. Phase IV should begin in January 2021.

Phase I

The ETS began in 2005, covering installations responsible for roughly 40% of EU CO_2 emissions. Establishing a (single) price for carbon was no small accomplishment. The first phase proved that the market operations functioned at a basic level. However, after beginning with relatively high prices, in Spring 2006 a sudden drop occurred after the EU announced that verified emissions were less than the amount of permits issued – effectively conceding that the cap had been set too weakly. For the rest of the period, lack of scarcity combined with an inability to bank permits for use in subsequent years of the ETS resulted in prices below €1 for almost the entire last year of Phase I (Figure 2.1).

The low carbon price reflected market fundamentals (i.e. an excess of supply compared with demand). Officials were able to apply some of the lessons from what was essentially a trial phase as they negotiated improvements in Phase II.

Figure 2.1: EUA daily closing price

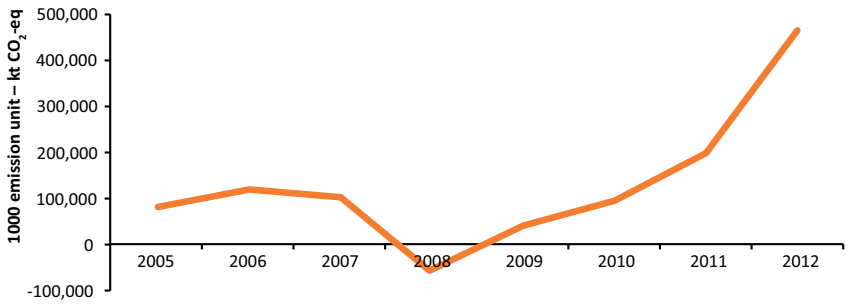
Phase II

Several alterations were made to the ETS as Phase II began, with a few extra changes coming into effect as the trading period went on.

- Norway, Iceland and Liechtenstein joined the scheme.
- Permits were made bankable and so could be used in future phases. Without the fear that permits will expire, they held their value better.
- Use of offsetting mechanisms became more common following the EU's Linking Directive (see Chapter 4).
- The EU began the transition to a centralised registry of ETS accounts.
- The process of bringing aviation into the ETS also began (see Box 4.1).

Despite these reforms, as with Phase I, Phase II was bedevilled by oversupply problems (see Figure 2.2).

Fig 2.2: Accumulation of surplus ETS permits over time



In part, this was due to the relative looseness of the original cap and, in part, due to the financial crisis, which saw demand for electricity and for the products of heavy industry decline. As the firms covered by the ETS did less, their demand for emissions permits also decreased. The number of permits being released into the system, however, went unchanged, with the cap set to achieve a 21% reduction on 1990 emissions within the traded sector by 2020 (as part of an overall reduction in emissions of 20% across the entire economy). Taking into account credits for projects outside the EU bought under the auspices of the UN Clean Development Mechanism and Joint Implementation policies (see Chapter 2) the 20% target was reached in 2012, again implying supply of permits would be far in excess of demand for the remainder of Phase III. This has led to calls to alter the permit supply that are, at time of writing, under discussion in the EU institutions.

Even so, although Phase II has had problems, the end of Phase II has not seen such dramatic falls in the value of permits as was seen at the end of Phase I. While it is true that certain commentators have described the price levels of €3–5 as "collapsed", they are still significantly higher than the prices of around €0.10 seen at the end of Phase I.

Phase III – the ETS until 2020

Phase III of the ETS began in January 2013. Again, it has made changes to the ETS.

- It features a much greater role for auctioning of permits rather than handing them to firms for free.
- It brings in new limits on use of offset projects from outside the EU
- It adds another new member country (Croatia).

The ETS now covers over 11,000 factories, power stations and other installations in the 27 EU Member States, Norway, Iceland and Liechtenstein plus, as of 2013, Croatia. Collectively, these installations account for just under half of Europe's CO_2 emissions.

It has already seen new controversies: there has been much discussion over whether permits should be temporarily withdrawn from the system to compensate for reduced industrial production after the recession. This process, known as backloading, is discussed in Chapter 5.

With Phase III having been underway for just a few months at time of writing, and with some of the reforms (such as offset controls) yet to come in, it is too early to make any firm judgments on the success or failure of these reforms. However, it is clear that the immediate impact that some observers hoped to see where carbon prices would immediately and substantially rise have not occurred. But more comprehensive assessments of the ETS are being saved for the impending review leading into discussions over the design of Phase IV.

What's Next? Consulting on the ETS after 2020

Although several debates relating to Phase III of the ETS remain unresolved, officials are already starting to look ahead and to prepare for Phase IV after 2020.

In March 2013, the European Commission released its Green Paper on next steps for the ETS, as well as broader questions about the future of European energy and climate policy (European Commission, 2013). The document raises the questions about whether the EU should adopt a '2030 package' of energy and climate policies and, if so, what form it should take. It mirrors the work that led to the adoption of the '2020 package' in 2007 and ushered in targets for carbon emissions, renewable energy production and energy efficiency by 2020.[3] The review offers the opportunity for officials to look beyond the temporary patching-up that has characterised some of the ETS reform proposals since the 2020 package was agreed, and to look more strategically about how the ETS functions and how it fits with other parts of EU energy and climate policy.

> "While external diplomacy is shaping the timetable, it is internal diplomacy that will have the more profound impact on the shape of the final framework"

The Green Paper raises many questions about how the ETS can be improved in Phase IV of the ETS and in climate policy up to 2030 (European Commission, 2013, pp. 13–14). The consultation closes in July 2013, with negotiations and decisions expected over the following 18 months. At minimum, the Commission wants to have a position on "a series of issues, including... ambition level" decided in advance of UN negotiations in 2015.

While external diplomacy is shaping the timetable, it is internal diplomacy that will have the more profound impact on the shape of the final framework. Splits have emerged on pre-2020 reforms, with the UK, Germany, France and Denmark having called for a move to a 30% carbon reduction target by 2020 and being opposed by many eastern and southern Member States (Harvey, 2011). The dividing lines in the 2030 debate are less clear at this stage, but the UK is pushing for greater ambition on carbon but also to avoid further renewable energy targets in the 2030 package (Davey, 2013).

What happens to the ETS will have a major impact on UK climate policy. The UK has adopted an ambitious set of pledges to lower the carbon emissions of its economy through the Climate Change Act and subsequent Carbon Budgets. However, those commitments depend, for both their effectiveness in addressing climate change and for their ability to avoid the worst effects on economic competitiveness, on the rest of the EU having commensurate ambition. As a result, the UK Government has committed to review the Fourth Carbon Budget in early 2014 and, if necessary, to "revise up" the budget to bring it in line with European

3 Policy Exchange's analysis of the '2020 package' can be found in *2020 Hindsight* (Moore, 2011).

ambition levels if EU targets are not strengthened (Department for Energy and Climate Change, 2012, p. 21). Ambitious policies at the Member State level can be critically weakened in the absence of a commensurately demanding Europe-wide cap, as policy to force additional reductions in the traded sector in one country are offset by less pressure to decarbonise in another. UK policy is no exception. A strengthened ETS – not simply a "continuation of the EU ETS's current trajectory" – will be key if the UK is to maintain its initially stated ambition on emissions reduction, particularly in power generation, for the Fourth Carbon Budget period and beyond.

3
Measuring Success

The ETS has led a tumultuous existence, marked by repeated 'crises' (some more serious and genuine than others), with price collapses, over-generous giveaways of permits, tie-ups with overseas projects of questionable environmental merit, suspensions of trading due to fraud accusations, and more. Yet greenhouse gas emissions from European installations are comfortably below the cap. So if emissions have reduced (and by a greater amount than the ETS's designers anticipated), why is there so much talk about the failed or failing ETS?

At root, it is a question of what is the purpose of the ETS. Much analysis of the ETS highlights two primary objectives of the ETS (for example, see Grubb, 2012):

1. reducing greenhouse gas emissions, and;
2. promoting low carbon corporate investment.

At least at its formative stages, the ETS was built around the former. The Directive establishing the ETS (Directive 2003/87/EC) did not make mention of an investment or innovation motive for emissions trading, and mention of technology is made purely in the context of deploying best currently available technology, rather than explicitly discussing the development of new technology (European Union, 2003). Only later were these objectives added to Directives, granting them greater significance than they had previously.[4]

The ETS is like a Rorschach Test for climate policy. Different people can look at it and see different things, reflecting their wider perspectives on climate policy. This makes assessing the success or failure of the ETS difficult, as people are often measuring the scheme against different metrics and benchmarks. Some possible ways of appraising it might include:

- Are emissions below the ETS cap?
- Has it reduced emissions compared to what would have happened anyway?
- Is it contributing enough to Europe's share of emissions reductions needed to slow or stop climate change?
- Is it encouraging other (non-EU) countries to implement sufficiently strong carbon pricing/climate policy?
- Has it delivered a carbon price which stimulates investment in currently known low-carbon technologies?
- Has it delivered a carbon price which stimulates low carbon innovation and development of new low-carbon technologies?

4 For example, Directive 2009/29/EC states that "...more predictability should be ensured and the scope of the system should be extended by including new sectors and gases with a view to both reinforcing a carbon price signal necessary to trigger the necessary investments and by offering new abatement opportunities, which will lead to lower overall abatement costs and the increased efficiency of the system." (European Union, 2009).

- Has it delivered a carbon price which stimulates investment in 'my preferred technology'?

Table 3.1 outlines several perspectives on the question.

Table 3.1: Is the ETS working?

Are emissions below the ETS cap?	The only one of the list that can be answered objectively – yes, emissions are below the cap.
Has it reduced emissions compared to what would have happened anyway?	Surveys have found evidence of modest emissions cuts attributed to the ETS. Carbon Strategies found the ETS it has reduced 2–5% of capped emissions over the first four years of the ETS (Grubb, Laing, Sato, & Comberti, 2012). Data for later years were harder to assess due to the difficulty of establishing a baseline for economic activity after the financial crisis.
Is it contributing enough to Europe's share of emissions reductions needed to slow or stop climate change?	Environmental NGOs have argued it is too weak. The 2020 cap is less stringent than Europe's 2050 carbon objectives, but while other international players remain on the sidelines assessing Europe's 'fair share' of mitigation effort is difficult Several Member governments have shown willingness to increase the 2020 target to 30%, particularly in light of the emissions reductions made 'for free' as a result of the recession.
Is it encouraging other countries to implement sufficiently strong carbon pricing/climate policy?	A comprehensive global deal still remains out of reach. However, South Korea, Australia and California and others have begun their own cap-and-trade systems, showing they see at least some value in an EU-style approach (see also Box 4.2). Again, whether action is sufficiently strong given the nature of the climate challenge, and the major economies not yet taking action, is open to debate, as is the question of how much influence the EU's choices had on the direction those other countries took.
Has it delivered a carbon price which stimulates investment in currently known low-carbon technologies?	Climate Strategies research found that emissions reductions in the ETS had been achieved through "mostly operational rather than investment responses" (such as switching from using coal to gas power stations to generate electricity) meaning they were "not so central in the context of what is required to meet Europe's long-term targets". (Grubb, Laing, Sato, & Comberti, 2012, p. 21). However, other policies have been forcing investment in, for example, renewable energy policies, preventing the ETS from having to.
Has it delivered a carbon price (or the probability of a price/emissions cap in the future) which stimulates low carbon innovation and development of new low-carbon technologies?	Not so far, because it has not yet needed to. Whether it does this in the future will depend on the stringency of future caps and the ability of existing technologies to reduce emissions to that level at reasonable cost.
Has it delivered a carbon price which stimulates investment in 'my preferred technology'?	Organisations with stakes in particular technologies (be they renewable, nuclear, CCS, or traditional fossil fuels in energy generation, or other industrial applications) want the policy to help their preferred solution. So far, this has mostly not happened as a combination of recession and emissions cuts driven by renewable energy policy have left little for the ETS to do. The main beneficiary had been gas generators as firms moved away from coal, although now with low carbon and coal prices, even that trend has begun to reverse (Energy and Climate Change Committee, 2013, p. 30).

Across this range of criteria, only the first is explicitly the purpose of cap-and-trade systems. The rest may or may not be achieved as part of the process of meeting the cap (Stavins, 2012). Consequently, if policymakers' priority is something other than achieving the carbon cap, a cap-and-trade system may not be the most appropriate way of pursuing their objectives.

The ETS doomsayers are often assessing the ETS against criteria it was never designed to meet. This disconnect between the policy and the perception means that, for some commentators at least, success within the ETS structure may never be achievable. Yet look at the job the ETS was designed to do originally and it suddenly looks rather more successful and, critically, the cap has always been met.

When the EU looks at reform options for the ETS, it should consider those that work within the structure that has been shown to work and not try to append additional objectives that a cap-and-trade system is inherently not optimised to do. The principle focus for ETS reform efforts should be the cap – its overall level and duration as well as whether it will be amendable in the future. Importantly, using the carbon price as a proxy for the health of the ETS will lead to the wrong policy conclusions.

Admitting the different perspectives on the ETS and its success or failure is the first of many steps in attempting to improve it. Because different groups have differing priorities, consensus is not likely to be achievable. Nor is the Phase IV settlement likely to be the last time these issues are revisited. Officials need to be humble enough to recognise that they will not solve all of Europe's energy and climate problems in one instrument, and that further iterative improvements in years to come are not just likely to be necessary but also desirable.

4

A Stronger, Longer-Term Carbon Cap

The ETS cap was set as a politically negotiated compromise between environmental effort and economic affordability. In 2008, heads of state from the EU member countries agreed on a target of 20% carbon emissions reductions from 1990 levels by 2020. While the 20% figure was a fairly arbitrary one, it fell somewhere between the more and less ambitious proposals, while also matching 20% commitments in the fields of renewable energy and energy efficiency, yielding, if nothing else, a relatively memorable slogan '20-20-20 by 2020'. 20% was thought to be a target that would represent a significant environmental commitment without creating a prohibitively expensive bill for European economies. The 20% overall reduction is achieved by a 21% cut within the ETS sectors, and a 10% EU-wide cut in non-traded sectors divided into varying national targets dependent on Member States' relative wealth as specified in the 'Effort Sharing Decision'.

Since that target was agreed, however, circumstances have changed dramatically. Decline in economic activity following the financial crisis and easy access to offset credits has meant that the 20% target has been met, if not without effort, then at least at a lower price than had initially been expected. Combining the effects of the recession with cuts mandated through other policies such as renewable energy targets (the subject of Chapter 6), the required emissions reductions for 2020 have been met in 2013 (Sandbag, 2013).

This Chapter will look at how both the tightness and the duration of the ETS cap should be revisited in order to preserve the effectiveness – and cost-effectiveness – of EU climate policy.

Cap coverage

The ETS cap covers emissions from heavy industry and power generation. Polluting activity outside the ETS, including things such as transport, household heating, agriculture and land use, is controlled and regulated differently, if at all. The advantage of cap-and-trade – that the market can identify the lowest-cost means of reducing emissions – does not extend to those areas. Furthermore, they are treated inconsistently across different countries, with some sectors lacking any carbon price signal while others are subject to regulation at much higher cost per tonne of carbon saved than the ETS price yields. Therefore, expansion of the ETS to other sectors of the economy could be a good way to improve carbon policy in Europe. This is not always straightforward, however, as Europe has discovered with its attempts to incorporate aviation into the ETS (Box 4.1).

Box 4.1: Aviation in the ETS

In 2012 the ETS was expanded to encompass aviation. Emissions from aviation account for around 3% of total EU greenhouse gas emissions. Internal European flights are now covered by the ETS, but flights between EU and non-EU countries are currently the subject of multilateral negotiations about whether and how they should be included. The initial intent of the policy was to cover all flights in or out of the EU, exempting incoming flights if the EU recognises that the country of origin is taking measures to limit aviation emissions from departing flights. Airlines get 83% of their required allowances for free, and the overall ETS cap was expanded by 95% of aviation emissions to produce the equivalent of a 5% cut in emissions from flights.

However, the plan has run into political problems. The governments of China and India forbade their airlines from complying, claiming the new law was an infringement of state sovereignty (China went one step further, and suspended orders for European-made Airbus airliners in protest). Other opponents include Russia, Japan and the USA. Because of the international opposition to the plan, the EU has 'stopped the clock' on implementing coverage to external flights in the hope that a global solution to aviation emissions can be reached through the International Civil Aviation Organisation (ICAO). The ICAO will meet in autumn 2013 to negotiate the issue. If this meeting fails to reach a solution, the Commission will apply the prior ETS legislation to external flights.

All this fuss has come about despite the costs to airlines being relatively small. The European Commission reckons the additional cost of a ticket from London to New York would be less than £2 per passenger (Hedegaard, 2012). Perhaps, as Hepburn argues, "airlines have a speculative but deep-rooted fear that being included within the EU Emissions Trading System now is the thin edge of a wedge that will eventually damage their long-run interests" (Hepburn, 2012). The threats of trade reprisals over the issue of inclusion of aviation are so disproportionate to the costs being imposed on airlines that they barely seem credible. It is also apparent that the arguments for including aviation in the ETS – that aviation is a growing source of emissions and that ETS participation is likely to be far less costly than other forms of regulation – are so compelling that the EU should be willing to reinstate the law should ICAO fail to resolve the issue.

In principle, at least, expanding the ETS to other sectors has economic appeal. It would enable a more uniform system of carbon pricing across the European economy, in some cases putting an emissions limit on activity which presently has none, and in other cases evening out unequal treatment of emissions from different sources. However, the practicalities of doing this are difficult. For small factories and other stationary emitters, compliance costs would make up a higher proportion of their overall costs than in bigger installations. Accounting for emissions from agriculture and land use is difficult. Transport fuel could potentially be covered somewhere upstream, but this would sever the direct link between emissions from combustion and the carbon price. Transport fuel is mostly taxed in Europe at a rate carrying a very high implicit carbon price (fuel duty in the UK is equivalent to £220.34/tCO_2e for diesel and £254.96/tCO_2e

5 Fuel duty for petrol and diesel is £0.5795/litre. Carbon content for petrol is 2.3kgCO2/l and for diesel 2.63 kgCO2/l (Defra, 2005).

for petrol)[5]. The question must be posed: would an additional ETS charge make that much difference to behaviour affecting different modes of transport when, for instance, other vehicle duties are already high in many countries. Similarly, it seems unlikely that this would help to promote low-emissions vehicles. In addition, as was raised at the roundtable discussion hosted by Policy Exchange, applying a carbon price on transport fuel would risk motivating a political fight that the ETS has so far managed to avoid by increasing its visibility to voters. Nevertheless, a carbon-capping approach to emissions from these sectors is likely to be a less costly way of achieving environmental objectives than other regulatory alternatives (as the high implicit price per tonne of carbon of UK fuel duty shows).

Recommendations

- The EU should continue to investigate ways that carbon pricing could be extended to sectors presently not covered by the ETS. That could entail more detailed investigation of the feasibility of applying a carbon cap to gas or transport fuel networks upstream.
- The EU must stick to its pledge to resume enforcement of the ETS on aviation if ICAO negotiations do not yield results.

Geographic scope and other ETSs

The other possible expansion of the ETS is geographic. Carbon leakage (see Chapter 6) is considered a risk because much of the rest of the world has yet to adopt any form of carbon pricing mechanism. Extending the geographic scope of the ETS ought to reduce the risk of 'carbon leakage' to the countries being brought under a unified emissions cap. As well as helping Europe to decarbonise, officials hoped the ETS could stand as an advertisement to the rest of the world; one that would show that it was possible to price carbon effectively while not damaging the rest of the economy (European Commission, 2013). While global agreement appears to remain a long way off, a handful of new cap-and-trade programmes are beginning to be implemented, with California and Australia among the most high profile (see Box 4.2).

International emissions trading rules set up a common framework under which certificates from one regional system can be used in another. This can allow different cap-and-trade systems to combine, effectively pooling their caps and the money available for investment. This can make a significant difference when regions are at different stages of decarbonisation. If the pool of cheap decarbonisation projects has been exhausted in Region A, but not in Region B, merging the two systems would likely result in a transfer of resources from Region A to fund low-cost decarbonisation efforts in Region B. While this might lead to short term emissions reductions being cheaper than they would otherwise have been across the two Regions, it also means that incentives to develop technologies to decarbonise at the marginal cost of carbon in Region A will have been reduced. Paradoxically, if merging systems causes prices to go down, incentives for new technologies may decline, even as incentives to lower emissions increase.

A political complication with linking systems is that initial price differentials can lead to an outflow of capital from the high price system to the low price

system. If an ETS is being measured by its ability to nurture investment (see Table 3.1) then this may dissuade higher-price ETSs from linking up with cheaper ones, even if it would lead to cheaper emissions reductions overall. The location of emissions reductions should not matter in this debate; the resultant climate impact is the same. But nationalistic politics can get in the way of utilising the most efficient outcomes. This should be resisted wherever it arises.

Expansion

The EU ETS includes three countries not in the EU (Norway, Iceland, Liechtenstein), as well as one which is on its way to accession (Croatia). These countries' economies are all highly interconnected to the rest of Europe and are all relatively small, meaning that the range of carbon abatement opportunities are limited. Joining the EU ETS would enable them expanded access to finance for domestic projects or to low-cost abatement opportunities in EU countries. Could the ETS bring in more countries in similar situations?

The Polish government has recently advocated attempting to bring into the EU ETS countries that are members of the Energy Community Treaty (Table 4.1) (Ministry of the Environment, Poland, 2012). However, these countries have been noncommittal about joining the ETS. Similar to Poland, their industrial and energy sectors are relatively old and relatively dirty. So, while there would potentially be major environmental benefits to pulling them under the cap, including access to potentially cheaper low-cost carbon reductions, some of those projects would be accessible through Joint Implementation under the Kyoto Protocol (see below). Bringing in more countries dependent on old heavy industry could also bolster the political lobby against a stronger, longer-term cap.

Table 4.1: Members of the energy community treaty

- European Union*
- Albania
- Bosnia and Herzegovina
- Croatia*
- Montenegro
- FYR Macedonia
- Serbia
- Moldova
- Ukraine
- Kosovo

*Current ETS participant

Linking to other ETSs

The EU ETS will form an interim link to the new Australian emissions trading system from 2015 (where Australian businesses will be able to use EUAs to comply with the Australian carbon cap) with a full two-way link complete no later than July 2018.

The EU envisages more of this kind of interconnection between regional schemes, on the way to a comprehensive global arrangement. As more of the world is covered by regional caps (Table 4.2) there are more opportunities for interconnection as risks of 'carbon leakage' diminish.

Table 4.2: Current and proposed emissions trading systems (International Carbon Action Partnership, 2013)

ETS in force	ETS implementation scheduled	ETS under consideration
• EU ETS (EU-27, Iceland, Norway, Liechtenstein, Croatia) • Australia • New Zealand • Kazakhstan • California • Regional Greenhouse Gas Initiative (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, Vermont)[6] • Quebec • Tokyo	• South Korea • China ETS pilots (Beijing, Tianjin, Guangdong, Hubei, Chongqing, Shanghai, Hangzhou, Shenzhen)	• China • Japan • Brazil • Chile • Mexico • Turkey • Ukraine • British Columbia • Ontario • Manitoba

However, unless different regional or national systems are set up with interconnection in mind, problems could emerge. A full two-way link between systems effectively establishes a unified cap between the two areas. If, for example, a relatively stringent European cap is merged with a relatively lax Australian one, both areas will be subject to an average of the two systems (Figure 2.5).

Responsibility for decisions about cap coverage expansion and about the interoperability of the EU ETS with other ETSs should become parts of the duties of the Agency described in Chapter 5.

Recommendations

- The EU should continue to pursue links with other ETSs, in order to bring as much of the world's emissions under a cap as possible, while enabling the market to seek out the cheapest carbon reductions on the widest possible geographic basis. However, care needs to be taken to ensure that other ETS systems provide a sufficient degree of ambition that linking the EU ETS will not undermine its ambition.

If structured in the right way, linked ETSs provide a better way of extending the international scope of climate policy than existing offsetting measures. However, as other ETSs have taken time to develop, offsetting has been the interim method of tackling emissions outside the EU.

Offsetting

Until non-European ETSs have developed further, the EU and the rest of the world can still join forces on decarbonisation projects, using the offsetting provisions of the Kyoto Protocol. However, in the European experience, offsetting schemes have delivered mixed results.

6 New Jersey withdrew from the RGGI in 2011

The EU ETS is joined to two 'flexibility mechanisms' set up under the Kyoto Protocol. These are:

- The Clean Development Mechanism (CDM). An emissions reduction equivalent to one tCO_2e under the CDM generates a Certified Emission Reduction (CER) certificate. CDM projects take place in less developed or developing (non-'Annex 1') countries which have ratified the Kyoto Protocol.
- Joint Implementation (JI) projects. An emissions reduction equivalent to one tCO_2e under JI generates an Emission Reduction Unit (ERU) certificate. JI projects allow one 'Annex 1 country' (as developed economies are known within the Kyoto Protocol) to support an emission reduction project in a second Annex 1 country, where reducing emissions may be cheaper, and have it count towards the first country's decarbonisation commitments.

The use of 'offsets' has had an impact on the effectiveness of the ETS cap. Carbon offsetting entails reducing greenhouse gases in one place to compensate for emissions from another. In principle, the concept of offsetting is a sensible one. By allowing the market to locate the cheapest emissions reductions, not just in Europe but around the world, it had the potential to lower the cost of tackling greenhouse gas emissions while providing a financial stake to less developed and developing nations. Access to offsets was set relatively expansively in response to fears of a very high carbon price (Elsworth, Worthington, & Morris, 2012, p. 10). In reality, as we have seen, the effects of the recession have subdued the carbon price, with the flood of offset credits further lowering prices.

Offsetting programmes have also rewarded projects with serious defects, which have undermined the environmental benefit and the integrity of the carbon market. If that abatement would have occurred otherwise (or worse, is the result of pollution, as described below, which was created with the purpose of then being stopped to earn money from selling credits) then the total abatement activity is reduced as a result of offsetting. Verification of 'additionality' in offsetting is thus extremely important, but it is also very difficult (hence the dozens of methodologies approved for CDM verification, UNFCCC). It is perhaps no surprise, then, that the system has not proven watertight, and that substantial quantities of permits of dubious environmental quality have permeated the ETS, hurting both its economic signal and its environmental effectiveness.

Many offset permits have come from a controversial – and soon-to-be outlawed – practice. Firms in developing countries can generate permits by destroying waste gases produced as industrial by-products and which have high global warming impacts. However, this has created the perverse incentive for those firms in developing countries to produce more of the by-product gases, in some cases by deliberately using inefficient manufacturing processes – so they can be paid for destroying the by-product (Rosenthal & Lehren, 2012). 82% of CERs imported in to the ETS have come from these industrial gas projects, at questionable environmental benefit (indeed, it is probable much of those gases would not have been produced in the first place were it not for the existence of the offset scheme) (Elsworth, Worthington, & Morris, 2012, p. 14). From April 2013, ETS participants will not be allowed to use certificates from HFC-23 and N2O destruction projects (European Commission, 2011). However, the impending

deadline has seen an even greater increase in this distorting activity, as firms rush to produce and hand in as many cheap permits as possible before time expires. New limits have also been introduced restricting CERs from countries that are neither 'least developed countries' nor those which have agreed to binding emissions control policies. Credits from large hydro-electric projects may be restricted in coming years. Each of these decisions leads to a rush to cash in credits before their eligibility disappears, exacerbating the flood of low-cost offset certificates into the ETS (Elsworth, Worthington, & Morris, 2012, pp. 12–13).

There are several offset entitlements built into different parts of the ETS. Carbon market charity Sandbag has calculated that, put together, those entitlements allowed 1.6 bn offset credits to be used in the ETS between 2008 and 2020, (roughly equivalent to Spain's demand for the period), of which around a third have already been surrendered (Elsworth, Worthington, & Morris, 2012, pp. 9–10). Initially, extensive access to offsets was considered a helpful 'pressure valve' that could moderate sky-high carbon prices. However, given the actual trajectory of carbon prices, the European Commission has described the limit on offsetting credits as "generous", accounting for up to 75% of the surplus in the ETS (European Commission, 2012, p. 9).

The delicate diplomacy surrounding offsetting complicates efforts to reform the system. Offsetting has been seen as a way of getting buy-in from countries like China and India which have been reluctant to sign up to binding emissions reductions. Without the 'carrot' of selling offsets, some fear these countries could drop out of the climate negotiations process completely. However, with a relatively generous offsetting regime in place, there is less incentive for China to agree to a stronger global emissions agreement. Firm evidence about which of these incentives dominates is hard to indentify. While the EU has the power to decide unilaterally which types of certificates it will and will not accept in the ETS, it is also well aware of the repercussions such a decision could have on the wider climate diplomatic effort. "The limiting of offsets ... is one way the EU is sending a signal to encourage the agreement of a global deal. The subtext is, if we all go forward together then we will re-open the market to the widest possible participation but if we are going alone we will restrict where we send our money." (Elsworth, Worthington, & Morris, 2012, p. 32)

Recommendations

With several reforms to the offset market in the middle of being implemented, it is hard to judge the effect they will have and whether subsequent reforms may be needed.

- Officials should be prepared to go further in regulating the offset market if the reforms fail to produce the desired improvements in quality and reliability of offsetting.
- The EU should make continued use of offsetting contingent on improvements in the environmental performance verification process.

Setting the cap level

Setting the 'right' level for the ETS cap is a complex task. Negotiations about the cap take in a range of factors: environmental benefits, expected level and

distribution of decarbonisation costs, impacts on global negotiations, and others. And once that target has been agreed, that has to be translated into a number of permits that should be issued – which can change frequently given alterations to the ETSs geographic and industrial scope. For example, adding Croatia and the aviation sector will mean a net increase in the total number of permits issued, even as the act of capping those new sources of emissions should lead to overall cuts in emissions.

The cap is currently set to reduce by 1.74% a year, until 2025 at the latest when it has to be reviewed. This will result in a 21% cut in emissions from the traded sector in 2020. This may well have turned out to be the initial relatively weak ambition. Combined with the effects of the recession, this has left such slack that tens of GW of new coal generation around Europe (8.4 GW in Germany alone) can be seriously considered by their builders, who do not envisage the cap constraining their profitability (BDEW, 2013).

In this section, we have made a simple analysis of the different degrees of ambition inherent in some EU proposals, as well as those implied by some of the ideas circulating in the UK Energy Bill debate. In recent months, a part of the UK energy policy debate has centred on the wisdom (or otherwise) of attempting to reach a level of carbon intensity for electricity production of 50gCO_2e/kWH. The figures used in this section are indicative, but present a useful basis for comparison. The scenarios are:

- Continuation of the **current trajectory** of reducing the cap by 1.74% of the average of 2008–2012 emissions per year.
- Speeding up the rate of decarbonisation in the short term, **reaching 30% cuts by 2020 then resuming the 1.74% reduction rate.**
- Speeding up the rate of decarbonisation in the short term, **reaching 30% cuts by 2020 then continuing at that sped up reduction rate.**
- **Continuation of the current trajectory reaching 20% cuts in 2020, then speeding up to reach 80% cuts by 2050.**
- **A linear rate of reduction from 2005 that results in 80% emissions reductions by 2050**, the target indicated in the EU's 2050 Roadmap.
- A rate of reduction equivalent to **reducing the carbon intensity of EU electricity to 100gCO_2e/kWH in 2030**. This is the degree of electricity decarbonisation in the UK initially recommended by the Committee on Climate Change.
- A rate of reduction equivalent to **reducing the carbon intensity of EU electricity to 50gCO_2e/kWH in 2030**. This is the degree of electricity decarbonisation in the UK being sought in a proposed amendment to the Energy Bill.
- A rate of reduction equivalent to **reducing the carbon intensity of EU electricity to 0gCO_2e/kWH in 2030 (total electricity decarbonisation by 2030)**.

The carbon intensity scenarios assume that the cap is reduced by the proportion necessary to reduce emissions only from the electricity sector to achieve those carbon intensities, leaving emissions from other industry unchanged.[7] They also assume no growth or change in the proportionate sizes of the electricity

7 For these carbon intensity scenarios, we took the proportion of electricity sector emissions cuts needed to get from today's 430gCO2e/MWh across the EU to 100/50/0gCO2e/MWh. This left electricity sector emissions at 23.3/11.6/0% of today's figures in 2030. These were then added to unchanged emissions from the non-electricity sector. Correcting for the 5.7% reduction in emissions from electricity between 2005 and today produced the implied 2030 carbon targets listed in Table 2.3.

generation sector compared with all other capped industries. They also do not account for any interactions between decarbonisation efforts in the ETS and for non-ETS sectors (e.g. if decarbonisation of transport is done via electrification, it would have an impact on electricity demand that is not reflected in this analysis. While this is a simple model compared to the complexities of what the ETS will look like, it provides useful indications, both of the level of ambition implied in the 80% 2050 target, and in the electricity decarbonisation target debate in the UK.

The relative ambition of these scenarios can be seen in Figure 4.1. It shows that:

1. The ETS with its current cap (and linear reduction factor, if it were continued past 2025) is relatively modest compared with other statements of EU climate ambition, such as the 2050 Roadmap.
2. The changes needed to meet targets for 2050, either by reducing the number of permits immediately, through pre-2020 withdrawal of permits, or by adopting more ambition in Phase IV.
3. If the EU were to adopt policies similar to the CCC's proposed 50g or 100g targets for electricity carbon intensity, that would represent a significant increase in ambition compared both to where the ETS is now, and where it is meant to be by 2050.

The EU has stated, in its 2050 Roadmap, that it hopes to achieve 80–95% reductions in emissions by 2050, in line with its assessment of Europe's 'fair

8 This analysis does not attempt to break down what proportion of this target should come from ETS and non-ETS sectors. It shows results for ETS sectors only. If decarbonisation is easier in ETS sectors, they might be expected to bear a disproportionate amount of total decarbonisation effort.

Table 4.3: 2030 carbon targets and reduction rates

Scenario	Implied 2030 carbon target (ETS sectors, as % of 2005 emissions)	Reduction rate
Continuation of the current trajectory of reducing the cap by 1.74% of 2005 emissions per year.[8]	36%	1.74%
Speeding up the rate of decarbonisation in the short term, reaching 30% cuts by 2020 then resuming the 1.74% reduction rate.	48%	3.125% (2012–2020), 1.74% (2020 onwards)
Speeding up the rate of decarbonisation in the short term, reaching 30% cuts by 2020 then continuing at that sped up reduction rate.	61%	3.125%
Continuation of the current trajectory reaching 20% cuts in 2020, then speeding up to reach 80% cuts by 2050.	39%	1.74% (2012–2020), 2.05% (2020 onwards)
A linear rate of reduction from 2005 that results in 80% emissions reductions by 2050, the target indicated in the EU's 2050 Roadmap.	45%	1.78%
A rate of reduction equivalent to reducing the carbon intensity of EU electricity to 100gCO_2e/kWH in 2030. This is the degree of electricity decarbonisation in the UK initially recommended by the Committee on Climate Change.	58%	3%
A rate of reduction equivalent to reducing the carbon intensity of EU electricity to 50gCO_2e/kWH in 2030. This is the degree of electricity decarbonisation in the UK being sought in a proposed amendment to the Energy Bill.	64%	3.4%
A rate of reduction equivalent to reducing the carbon intensity of EU electricity to 0gCO_2e/kWH in 2030 (total electricity decarbonisation by 2030).	73%	3.9%

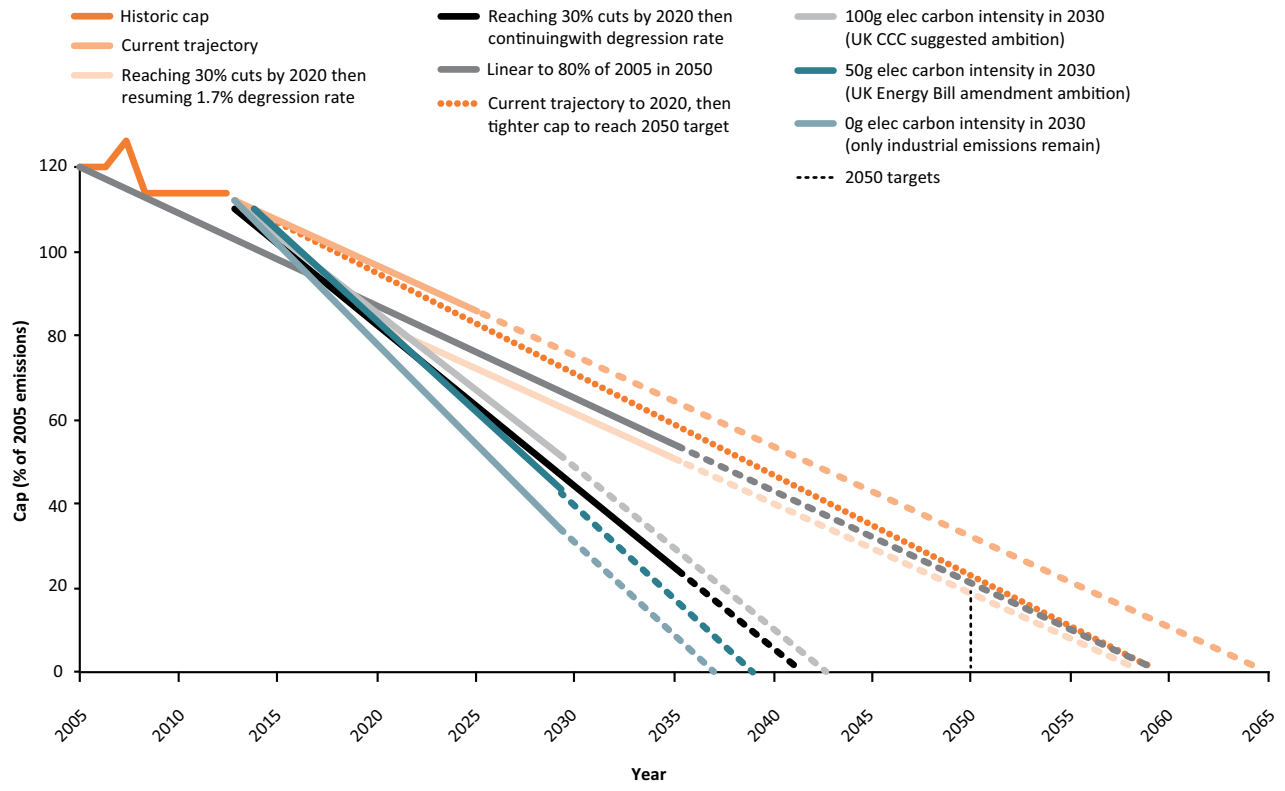
share' of global emissions cut aimed at giving a 50% chance of limiting average global warming to 2°C (European Commission, 2011).[9] The current rate of ETS reduction would not hit that target, leading to a 70% cut by 2050 – some way short of the stated EU ambitions for that date (and that only includes the traded sector, where above average contributions to decarbonisation are expected). All the other scenarios would reach at least the high-emissions end of the target. They would imply the ETS caps for 2030 shown in Table 4.3.

If continued beyond 2020, the rate of decarbonisation implied by a 30% target in 2020 would see the total decarbonisation of all capped sectors by 2043 (the current trajectory reaches full decarbonisation in 2067). The rates of decarbonisation implied by the 100gCO_2e/kWH and 50gCO_2e/kWH electricity intensity targets are comparable to the rate of decarbonisation implied by a 30% target in 2020. They are all more ambitious than the EU 2050 Roadmap. Some argue, though, that an even more aggressive pace of early decarbonisation in the electricity sector is needed, in order that other sectors can subsequently be decarbonised through electrification.

These estimates also demonstrate the disparity in ambition between the EU's current ETS trajectory and the decarbonisation in the UK advocated by the Committee on Climate Change and the Energy Bill amenders. It should also be stressed that if the UK pursues the CCC's ambitious path without a commensurate level of ambition in the rest of Europe, the emissions saved in the UK will be emitted in a different country rather than removed from the atmosphere. Applying the proposed UK ambition on a Europe-wide basis through the ETS would imply (at least) a doubling of the EU's decarbonisation effort.

9 By the terms of the Directive, the current cap trajectory must be reviewed by 2025 at the latest.

Figure 4.1: Decarbonisation scenarios – comparing ambition rates

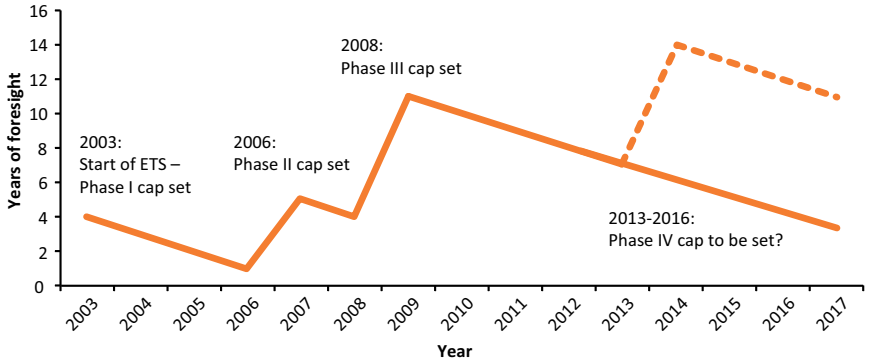


Those scenarios that most closely correspond to the EU's stated ambition for 2050 suggest an estimate of a 45–50% target for 2030 (or around 55% for 2035, see below). The EU should ensure that the ETS, as the principle instrument for achieving its climate objectives, pursues that level of ambition when it sets its next cap.

Cap timescales

The current ETS rules stipulate that phases will last 8 years. There is no requirement for when a change for a new or upcoming phase have to be agreed, but each time to date there has been some forewarning of what can be expected. As seen in Figure 4.2, this means that, from the point at which they have been agreed, ETS caps have given at most 11 years of certainty, but with an average over that time of just 7 ½ years. If a new 8 year cap were agreed next year, that would give 14 years of foresight (from a decision in 2014 to the end of the cap phase in 2028).

Figure 4.2: ETS cap horizon



Wind turbines have expected lifespans shorter than most other generation infrastructure and are expected to last 20 years. Nuclear power stations are built for 40 years or more (Mott MacDonald, 2011, pp. 6–4). The ETS has never provided that length of signal. Currently, the EU is working on a package of climate and energy targets for 2030. While it arguably makes sense to align setting the ETS cap with that Framework (implying a 10 rather than 8-year Phase IV), it is worth asking whether 2030 is the appropriate date to aim for when setting another round of targets. At the start of previous phases, the cap horizon has been lengthened – increasing the durability of the signal given by the ETS as part of the process of iterative improvement that characterises the system. If it is to provide a durable enough signal to underpin major electricity generation infrastructure investments, would a longer-term commitment be more valuable?

The trade-off inherent in decisions over the cap duration is of certainty versus ability to respond to change. Longer caps may give greater policy foresight to investors, but they also increase the risk of events occurring which make previous decisions less appropriate. This can then increase pressure to change rules midway through an agreed period, undermining the certainty that had been sought in the first place. On the other hand, shorter caps give flexibility to change the rate of decarbonisation, but may be unable to spur investments in long-term projects because of the lack of confidence in the existence or stringency of the policy years ahead. As Hepburn argues (Hepburn, 2006, p. 234),

> *"[T]he time horizon of committed policy must be long enough to balance the costs and benefits…The time horizon must, however, be short enough to be credible. In some policy areas, including climate policy, where the longest feasible commitment period may be too short to provide adequate incentives for long-term investment, the problem is finding a credible signal of future policy direction to firms. Credible signals are difficult to find, however, and by their very nature, they tend to be costly."*

He argues commitment periods of "several decades" are needed to make cap-and-trade an attractive policy instrument. Hepburn concluded that paper with a call for an analysis of longer (10+ year) commitment periods

"Several European governments are compensating for weaknesses in the signal given by the ETS (and the need to meet the target for renewable energy production) with expensive additional support mechanisms for low-carbon generation investments"

At present, several European governments are compensating for weaknesses in the signal given by the ETS (and the need to meet the target for renewable energy production) with expensive additional support mechanisms for low-carbon generation investments. In the UK, this includes the currently operational Renewables Obligation, and the forthcoming Electricity Market Reform programme to give generators guaranteed electricity prices into the future. Other countries have chosen different methods, such as feed-in tariffs (FITs). All of these programmes have in common a longer commitment of time (and of money) from governments than the ETS cap. This shows that Governments are willing to make longer-term commitments than those currently proposed under the ETS. They also imply a much higher cost per tonne of carbon saved than seen in the ETS, demonstrating Hepburn's point.

Recommendations

- The EU should adopt a longer-term carbon cap in Phase IV, that can offer market participants greater clarity about the future position of the carbon cap. It should aim for a cap in keeping with the duration of major energy infrastructure investments, with at least 20 years of foresight, at a level in keeping with the EU's climate policy objectives. This would imply, for any cap set in 2015, that the period to be covered would extend as far out as 2035.
- A 2035 cap set to reduce emissions in the traded sector by approximately 55% compared to 2005 levels would be in keeping with expressed EU objectives for 2050. If EU leaders are determined to create a target for 2030 instead, this should be set to reduce emissions in the traded sector by 50% compared to 2005 levels.

Lengthening the time horizon of the ETS will make a clear set of rules for potential amendment of the decision more desirable in order to maintain political credibility. In Chapter 5, we will assess some options to help improve the balance between certainty and flexibility.

5
Managing the Cap

Why is cap management necessary?

There is an unavoidable trade-off in managing the ETS, between, on the one hand maintaining a predictable and stable market that allows participants to make informed decisions about the future, and on the other, being able to respond if the broader economic and policy context surrounding the ETS changes. The current structure has emphasised the former, but not with the desired results. Without a formal process for amending the ETS, a chaotic and unpredictable process has arisen instead.

In an ideal world, the ETS would not need any intervention. Policymakers would make the right decisions at the start and there would be no lobbying for change. However, such a scenario is impossible considering the complexities of the systems involved. A clear structure about when intervention will and will not be contemplated is the next best alternative.

The ETS does not have a clear process for altering the cap. The ETS was supposed to function with minimal intervention from officials. However, as the impact of the recession on the ETS became clear, calls for intervention of some kind to keep the system afloat have increased (Harvey, 2013). In the absence of any clear procedure for intervention, firms and investors have been left trying to parse statements from EU Commissioners and negotiators from the various EU Member States to work out what form intervention could take, how it might affect the market, and perhaps most importantly, whether it would be repeated again in future years.

Not having a system for altering the ETS cap was meant to reassure investors that the cap would not suffer politically motivated change. However, the opposite seems to have been the case: the very lack of a change mechanism has unnerved investors who now believe that not only are changes inevitable, but they also will occur in a chaotic manner that cannot easily be planned for. This scenario is, self evidently, hugely disruptive.

The ETS is unlike most markets. It deals in a product that is purely a creation of policy – EUAs have no value outside the ETS. The market exists to serve a wider policy purpose. If, by any of the other measures in Table 3.1, it is seen as not succeeding, then it is appropriate to look at what kind of reforms would make it effective.

Avoiding short-term ETS reform because of a reluctance to impose higher costs on industry may backfire if it leads to other interventions that end up costing even more. Europe has already seen intervention of this kind when the Renewable Energy Target was introduced, simultaneously undermining the ETS and making

decarbonisation more expensive. Likewise, there is a risk that, if the ETS becomes *politically* unsustainable (regardless of whether it is succeeding by any of the Table 1.1 definitions), politicians may end up replacing it, either with something more costly or less environmentally beneficial.

Certainty (or at least clarity) for market participants is valuable. But this cannot and will not be achieved by attempting to preserve current ETS market structures in aspic. Certainty is not much use if it is only the certainty that a broken policy will not be fixed. Political pressure will only increase if ETS prices continue to decline, with the risk of more *dirigiste* options being taken instead.

Backloading: a flawed cap management plan

In the summer of 2011, the European Commission published its draft Energy Efficiency Directive. It rapidly became clear that implementation of the Directive could remove a substantial amount of demand for ETS allowances. Prices in the ETS collapsed, and have never recovered since. To correct for this, the European Commission made some further proposals – to remove either temporarily or permanently some of the supply of allowances from the market. The proposal to delay the auction of some permits, in a process known as backloading, was the first to be voted on, in the hope of securing a quick fix. In April 2013, the European Parliament voted against it. At time of writing, a second vote has been scheduled for July 2013.

The backloading proposals would have delayed the auction of some volume of permits from 2013 to later in Phase III, temporarily reducing the supply of permits in the system. It was hoped that this might help bolster the price permits commanded in the ETS market. It was also thought likely to be easier to keep permits out of the market if their auction had been held back than to remove them from the market once they have entered it, meaning that backloading could have been seen as a waypoint to full cancellation of some permits.

The backloading proposal has a number of serious problems. It is explicitly aimed at boosting the carbon price (Stearns, 2013). This undermines the main premise of a cap-and-trade system, which is that the price is an outcome of the cap-setting decision. It may not accomplish that if it passes. Given that the overall permit supply for the trading phase would be unchanged under the backloading proposal, and that banking and borrowing mechanisms allow companies to adjust for changes in timing, there is little economic basis for expecting backloading to have a major impact on price.

However, the protracted negotiations over the issue have turned it into a political symbol, with approval of backloading standing as a proxy for approval of fixing the ETS more broadly. It is to an extent a political fudge masquerading as an important intervention. A vote against backloading does not mean that you are necessarily against the ETS or action on climate – it could simply be that this is not seen as the appropriate remedy to the ETS's problems. Yet campaigners, politicians and analysts rallied around backloading as a stand-in for all these things.

After the first rejection of the backloading proposal, numerous pundits wrote off the ETS (see The Economist, 2013, Clark & Chaffin, 2013, Washington Post Editorial Board, 2013, Thomson Reuters Point Carbon, 2013 amongst many others). But emissions are below the cap, and the price of carbon reflects the balance of supply and demand in the market. If the EU revisits the idea of a short-

term fix, it should instead look to options that work with the ETS model rather than against it. This means solutions that focus not on the price, but on the cap. Before 2020, increased environmental ambition through permanent removal of allowances from future auctions is the only reform that matches the logic of the ETS. Aligning the pre-2020 cap to longer-term commitments may be a desirable reform (though it is by no means an essential one – as Chapter 4 showed, a more ambitious Phase IV cap can get on that track regardless of Phase III reform; amending the Phase III cap may smooth out abatement activity between the 2010s and 2020s).

Permanent cancellation of permits would be a more sensible response to the current disparity between the expected position of the ETS at the time the cap was being set and its current post-economic crisis reality. However, the with the current institutional structure and political attitudes, it is difficult to see it being approved. It would be preferable if this process could be formalised in the institutional set-up described later in this Chapter. If intervention is the market is to occur it should not be done in an arbitrary manner, as this can undermine participant's confidence that unexpected intervention will not occur again in the future.

> "If backloading is a necessary first step on the route to proper reform of the ETS, it merits support, albeit with little enthusiasm"

Approval of backloading is unlikely to determine the long-term future of the ETS. It is far from clear whether it is important, even in terms of political credibility, which way the vote will go. Nevertheless, if backloading is a necessary first step on the route to proper reform of the ETS, it merits support, albeit with little enthusiasm.

A long-term approach

In future phases of the ETS, the chaos ought to be reduced as far as possible. One way to allow the system to respond to changing information, while providing clarity to investors, is to set out in advance the circumstances that might trigger change. As Grubb argues, "setting out the rules clearly in advance is not 'interfering with the market', but part of the process of designing the market". (Grubb, Reforming the Carbon Market, 2012, p. 32). To a very limited extent, the ETS has already done this – for example having indicated that completion of a global deal on climate would see the EU cap tighten from 20% to 30% of 2005 levels by 2020. While it is impossible to foresee every possible problem that might hit the ETS, there are a number of 'contingencies' that are foreseeable. This chapter looks at some potential contingencies that should be built in to the ETS in the future.

Regardless of one's view about the current 20% target, the question of whether a process for amendment should be built into future phases can be reduced to the question, 'should a bad decision on setting the cap be kept on the books until the next phase is due?' If one moves to create longer-term carbon pricing signals through longer cap phases makes the issue even more pressing, as without any amendment mechanism, a misjudged cap decision would have long-lasting repercussions. It seems implausible that the confidence boost inspired by stubbornly committing to retain a judgment that was based on bad information would outweigh that given by some semblance of responsiveness to the real world.

The rest of this Chapter will look at two principle metrics for managing the ETS:

- Predictability of intervention (i.e. that any intervention that is to occur can be anticipated and prepared for by participants in the market).
- Political independence of intervention (i.e. that any intervention that occurs be in support of the functioning of the market and its climate policy objectives, and not motivated by short-term political factors).

These lead to a related pair of questions:

- When should intervention in the ETS be considered?
- And who should decide whether intervention should take place and what form that intervention should take?

Potential grounds for intervention

Price

Since it began, the rationale behind the ETS has been to set a target for emissions from European industry, via the cap, rather than for a designated carbon price. The logic of the ETS means that debates about its functioning ought to focus on the level of the cap, rather than the resultant price. However, the low prices produced by the ETS, perhaps inevitably, have been the focal point for criticism.

Most ETS coverage has focused on the price carbon emissions allowances have traded at. This reflects ongoing disagreement over the merits of quantity versus price setting (see Chapter 5) together with the financial calculations that market participants must make on a continuous basis and the fact that this is the most visible metric in the carbon market. The idea of establishing a price contingency (or contingencies) that would trigger intervention in the market is thus often discussed (European Commission, 2012, pp. 9–11). This entails a carbon price floor, a price ceiling, or both (creating a 'collar' of values that the carbon price can take). If the price floor was reached, permits would be withdrawn from the system until prices had risen sufficiently. Member states or the EU could pledge to buy up permits if the price dipped below a certain threshold, until the ensuing scarcity caused prices to rise, as outlined by Hepburn (Hepburn, 2006, p. 239). If prices reached the ceiling, more permits would be created until the price came down.

Another way to manage the carbon price and the release of permits into the market would be the creation of a Europe-wide auction reserve or floor price. Not selling permits below a pre-determined price would tighten the cap at times when supply exceeds demand and prices are at the floor. While this would increase price certainty for market participants (and for the governments selling permits in the auctions), it would reduce volume certainty depending what happened with unsold permits, which could potentially present a problem for selling governments if they struggle to predict how many permits they will be able to sell in a given budgetary period.

The idea of price controls is not completely anathema to present ETS rules. The 2009 Revised Trading Directive already includes price management measures to be applied if the carbon price rises sharply, by bringing forward permit auctions

(European Union, 2009, Art. 29a). This option has never been utilised though, as dramatic price rises have not occurred. However, depending on the prices at which they were set, a carbon price cap, floor or collar could be activated more often.

Either of those options would move the ETS away from being purely a quantity-setting instrument into becoming a hybrid price-and-quantity instrument. This has advantages and disadvantages. A floor would mean overpaying for decarbonisation if it was set too high, while a ceiling would reduce the environmental impact of the policy beyond a certain cost. Either could also reduce the ability of the market to provide information – namely the price it takes to get a certain level of decarbonisation if the price goes past the floor or ceiling. It would increase price certainty, giving some protection to both investors and households (although companies and households already have to cope with commodity cost uncertainty and are adept at doing so).

Setting price limit values creates a political economy challenge, by requiring member states to agree on a second major judgment. In addition to agreeing the cap, as has to happen under the current system they would also have to agree at what price the floor and/or ceiling should be set.

It is not obvious that there is an optimal floor, meaning the political challenges of reaching agreement would be substantial (a "political nightmare" according to Müller *et al*). The process would provide another bonanza for lobbyists (Müller, Michaelowa, & Vrolijk, 2001, p. 32). The further policymakers move down the road of setting prices, the greater the temptation to go the whole way and change the system to a carbon tax (Chapter 7).

Since the UK has adopted its Carbon Price Floor (CPF) it arguably has an interest in getting the rest of Europe to adopt price constraints as well, to remove that source of competitive distortion. It should also be pointed out that the main flaw of the UK CPF – that it just means emissions move elsewhere in the EU under the cap – would not be true of a European price floor.

Low carbon prices are symptoms of other problems with the design of the market. The low-carbon price symptom could be addressed by setting a carbon price or price band. Both are technically and economically feasible. However, such a step risks creating different problems while remaining susceptible to some of the same weaknesses that have bedevilled the ETS to date (Stavins, 2012). Other, better ways to tackle the problem than constraining price outcomes would involve making the cap more stringent (Chapter 4) and addressing the problems caused by interactions with other 'complimentary' climate policies (Chapter 6).

Macroeconomic performance

Calculation of the cap in previous phases of the ETS has been based on an assessment of the economic and environmental impacts. While in large part these have reflected political haggling, effort has been made to find a cap that fits with projections of the future. However, the recent crisis of confidence in the ETS could be attributed, at least in significant part, to the cap no longer matching up with with the state of the European economy. The decline in output resulting from the financial crisis has left supply of permits vastly exceeding demand, leading to low prices. This has left "a completely different balance of environmental ambition and economic cost than was actually intended in the original deal" (Grubb, Reforming the Carbon Market, 2012).

Officials could build into the ETS rules a trigger that activates if actual economic performance differs by a pre-determined amount from the projections used when the cap was being set. There are practical difficulties to this approach though. Determining an appropriate extent of disparity between projection and real-life for the trigger to activate is not an exact science. For context, EU GDP is now about 3% below where it was expected to be in projections issued when Phase III was being completed, and dipped as far as 4% below expectations in 2009 at the depths of the financial crisis (European Commission, 2008, p. 44).[10] Likewise, a lot of assumptions go into the analysis in advance of the Commission recommending a particular cap setting.

Identifying changes that would be important enough for the cap to need to be reviewed would also be a question of judgment. GDP, as an approximation of economic activity, is the most prominent one that was highlighted by the last recession. But one could also see how, for instance, changing composition of economic activity between industrial and other sectors, or evolving information about the costs of low-carbon technology options would be relevant.

A predetermined level of divergence of actual experience from assumptions used in setting the cap should be used to establish when intervention will be considered. This could be similar in form to the way the Bank of England targets inflation. The UK Government has set the Bank a 2% target for annual inflation. If the target is missed by more than a percentage point in either direction, the Governor must explain why that has occurred and what steps the Bank proposes to ensure that inflation returns to the target level. Establishing similar bands of certainty around the components of the cap-setting decision would make clear to investors the circumstances in which change could be expected. Based on recent experience, a discrepancy of the magnitude of 2–3% from expected GDP level would be an appropriate trigger point for intervention.

Overlapping policy

Chapter 6 will look in more detail at where the ETS has suffered from contradictory and conflicting overlapping policies. While avoiding imposing policies that weaken the ETS would be the best option, if politicians are going to do so, the ETS should be able to adjust to reflect the new policy environment. This would entail the opportunity to revisit the cap level if EU Directives that have a material impact on the ETS are introduced (as the Energy Efficiency Directive did in 2011).

An even more ambitious contingency would allow interventions when national as well as European Union policies changed. This would mean a proposed national policy that overlaps with the ETS would be assessed to estimate its emissions impact, and the cap be adjusted up or down accordingly so that the balance of supply and demand was unaltered. That would allow individual EU members to take more aggressive unilateral actions, without the problem that emissions would be transferred under the cap to another EU emitter, enabling genuine emissions reductions from domestic policy. However, it would create sovereignty issues, as Member States would be able to take actions that increase the costs borne by other members of the Community. Such a step would be extremely politically problematic to accomplish. If Member States are particularly minded to tighten the cap unilaterally, they always have the option of buying up and retiring allowances or refusing to sell their national allocation.

10 Calculation based on growth trajectory described in Table 5 of European Commission, 2008 and Eurostat data.

Global climate agreement

When it agreed the 20-20-20 package, the EU made an offer to the international community, that it would increase its ambition to 30% if other countries agreed to sign up to a binding international climate change agreement. In the event that the EU moves unilaterally to 30% (see Chapter 4), this commitment will need to be revisited, and either extended further or abandoned. If, as seems more likely, no global treaty is in place before ETS Phase IV negotiations occur, the framework should include a commitment to review the cap and ensure it is compatible with the outcome of any global agreement. Once a global agreement has been reached, a commitment to further increase EU ambition if other countries join would have no additional value.

Climate science

Creating a rule to quantify changes to climate science that would justify amending the cap would be very difficult. The political and policy interpretation of climate science is a perilous area to navigate. The UK Climate Change Act attempts to cover this ground with relatively vague wording, saying scientific knowledge must be "taken into account" when setting carbon budgets, and that the overarching target for 2050 can be amended, "if it appears to the Secretary of State that there have been significant developments in scientific knowledge about climate change". (HM Government, 2008) Nonetheless, a significant shift in scientific understanding about the risks of climate change could make revisiting the ETS cap desirable, and a similar provision would be helpful in guiding an ETS supervisory body.

Recommendations

Intervention in the ETS market should not occur when the system produces a result that some politicians or stakeholders do not like. In the ETS, it is the cap, rather than the price that is paramount. However, policymakers ought to be able to correct the system to bring it in line with real world experience.

The cap-setting decision should be able to be re-opened in cases where:

- macro-economic conditions, have diverged significantly (a discrepancy of the magnitude of 2–3%) from what was assumed when the cap was being set.
- the EU passes non-ETS climate policy that has or will have a substantive impact on the ETS market.
- scientific understanding of climate change has shifted.

It should not be re-opened in response to particular price levels.

The next section looks at different possible institutional arrangements that could take on the role of managing the cap and apply these proposals.

An Institution to manage the cap

In recent decades, there has been an increasing move towards central bank independence in developed economies, as a way of trying to insulate monetary policy from excessive political interference. Politicians, it has been widely argued, could not be trusted with key economic levers, as they would tend to abuse their

authority by seeking to spur economic growth in the run-up to elections in ways that were potentially detrimental to long term growth; the theory was that the short term boost to the economy would be sufficient to give the politicians concerned another term in office.

A similar situation can be described in climate policy, where politicians may be reluctant to enact beneficial long-term policies because of short-term electoral fears or to manipulate the supply of carbon permits in order to mollify industrial lobbies. Taking decisions about, for example, supply of permits, out of a negotiated settlement between national ministers and into a politically independent and transparent setting could see more clarity injected into the ETS market and improve the confidence of the entities participating in it. However, many challenges would need to be overcome in order for such an institution to be both effective and attractive. This section will analyse some of those issues.

How would an independent institution work?

What would an independent institution do? What would its powers be? Box 5.1 describes how some existing institutions have been able to address some of the questions establishing a new carbon authority would pose.

The case studies in Box 5.1 suggest some of the possible roles of a new carbon institution. It could have powers to set cap levels itself or advise politicians on them as the CCC does in the UK. It could set or adjust caps in response to the criteria discussed earlier in this Chapter.

Under present ETS rules, intervention in the market in the middle of phases is possible, but requires lengthy negotiation between Member States, the European Parliament and the Commission. The process for intervention is messy, with approval from many different committees required. The Commission has wide freedom to propose any intervention it believes is suitable and this can leave market participants trying to guess what might be proposed in future months (though it should be recognised that, prior to the backloading debate, it tended to avoid interventions in the ETS market). The arduous process for deciding whether, when and how to intervene as backloading and alternatives were being considered has bolstered calls for a clearer process, similar to the transparent process in key central bank decisions. (Sustainable Prosperity, 2011)

A Central Bank-type institution also implies stricter rules about announcements and releases of information. The ETS has seen Commissioners, officials, Parliamentarians or committee members and national leaders releasing information, which affects the market, in a somewhat haphazard and uncoordinated way. A recent review of the ETS by the Centre for European Policy Studies (CEPS) recounts that, "at one stage the market was moved by around 10% based on information which appeared to have been leaked by a Directorate General of the European Commission. This happened after the European Commission had put into operation rules and practices on how to communicate market sensitive information, after similar incidents occurred in the early stages of the ETS operation" (Egenhofer, Marcu, & Georgiev, 2012, pp. 19–20). Formalised information dissemination procedures and a formal timetable could help avoid such confidence-damaging shocks and public disagreements between key decision makers. The Bank of England or the US Federal Reserve hold regularly scheduled meetings with consistently structured announcements of committee members'

Box 5.1: Institutional case studies

Existing institutions provide case studies of the way a more politically independent climate or greenhouse gas emissions policy might operate.

Central Bank Model

Most Western economies have granted central banks a degree of independence from government. This can include independence over staffing decisions, goal-setting independence, and operational independence over how a goal (set by the central bank or by the government) is to be achieved. While usually subject to some degree of formal oversight by political institutions (and the tacit understanding that there are boundaries of socially and politically acceptable behaviour that the central bank must operate within), independent central banks have significant discretion over important economic decisions.

A Carbon Central Bank would be charged with buying and selling volumes of allowances to manage supply, either in response to internally set objectives, or in response to rules or targets set by European politicians. These could include explicit price targeting, but could also include others on the grounds for intervention outlined earlier.

The UK government argued for a European Carbon Central Bank in 2008 (Taylor, 2008). It described its vision of "an independent body, with technical, economic and financial expertise, which would be responsible for:

- setting future caps for the EU ETS; and
- establishing how the carbon market should operate in the future." (Defra, 2008, p. p. 22)

The proposal came as part of the negotiations in advance of Phase III of the ETS. However, there was little appetite for it from other EU members (nor from the Commission, whose role in the ETS would have been effectively replaced).

Committee on Climate Change model

As part of the Climate Change Act 2008 (CCA), the UK established a new institution called the Committee on Climate Change (CCC) to advise the Government on greenhouse gas emissions targets. It also reports to Parliament on progress made in reducing emissions. The CCC has no implementation powers, but its recommendations carry political weight, enhanced by its politically independent status. Politicians who intend to disregard the Committee's recommendations have to defend the case for rejecting the expert advice.

The CCC assesses the best way of meeting the target of cutting greenhouse gas emissions in the UK by 80% by 2050, established in the CCA. The CCA requires it to take into account climate science, technology developments, economic consequences, fiscal consequences, social impacts (including fuel poverty), security of supply and circumstances at European and international level when making its recommendations (HM Government, 2008, Section 1.10). It advises on the setting of carbon budgets (effectively, national economy-wide emissions caps covering five-year periods) that are meant to describe the trajectory of decarbonisation on the way to the 2050 target.

In the ETS, the European Commission plays a similar role. As a politically independent agency, it too can make recommendations about the setting of future caps (as well as on interim decisions such as set-aside or supply management). These recommendations are then taken into account by the European Parliament and by national leaders in the European Council when they negotiate the final cap-setting decision.

votes and minutes of meetings. The transparency of proceedings allows those affected to see the balance of the debate on key issues (in the case of central banks, decisions about for instance, interest rate changes or quantitative easing, among others). By contrast leaks of critical information from officials regarding the ETS are common, something that would be treated very seriously by a central bank.

An independent agency should also assume responsibility for matters such as the interoperation between the EU ETS and other external ETSs, to ensure that linking does not have detrimental impacts on the environmental or economic rationale underpinning emissions trading. It should take a leading role in indentifying opportunities for expansion of the ETS into further sectors of the economy and in devising rules for their inclusion.

Independent decision making might also reduce the incentive for short-term political expediency to dominate over longer-term policy effectiveness. It is, however, unclear the extent to which this is a problem. While the ETS is still too short-term (see Chapter 4) it has an established time horizon far longer than typical European political terms of office. Do politicians feel constrained to make 8-year decisions rather than 20+ year decisions because of 4–6 year election cycles? Or is there a different motivation behind the relative shortness of some ETS policy? After all, other aspects of European climate policy, and commitments made at the nation state level, such as the Renewables Obligation and Contract for Difference policies in the UK, or the Feed-In Tariff commitments made in Germany and Spain, entail much longer-term commitments (20+ years in many cases) of finance, of resources and institutions. Electoral expediency evidently did not override establishing those.

> “If the Bank of England started behaving far outside the boundaries of political expectation, it could expect to be reined in. It succeeds because it understands those constraints and abides by them”

There are some advantages to national-interest motivated bargaining and political short-termism. Political oversight provides accountability. It forces climate policy to be justified in the same way that any other aspect of public policy has to be. Independent central banks are still accountable to politicians. Their operational independence is assured by policy not straying outside areas of political consensus. If the Bank of England started behaving far outside the boundaries of political expectation, it could expect to be reined in. It succeeds because it understands those constraints and abides by them. But it still needs the consensus about what it should be trying to do. And while all EU members have affirmed and reaffirmed a consensus about the objectives of European climate policy, they have not shown unanimity about the methods of achieving it. So it boils down to one very basic question – would Poland accede to an independent agency that could decide in favour of a policy that Poland has repeatedly rejected?

When to Intervene?

A roundtable discussion *Policy Exchange* hosted in early 2013 discussed the idea of introducing a regular review schedule, constraining the times at which intervention might occur, and regularising releases of information about the

market. These review windows could operate in combination with the previous suggestions for rules as to what circumstances would necessitate intervention, or allow intervention for any reason. In combination with the other suggested rules, review windows would add further predictability for market participants to know not just whether, but when, intervention could occur, becoming a restraint to intervention.

However, there is a risk such an approach would still constrain the ability of the system to respond in the event of a fast-developing problem. A regular review window would also create a constant cycle for lobbying efforts aimed at influencing decisions about the ETS.

The frequency of review windows would be an important variable: open it up too often and there will be little improvement on a system that allows intervention at any time: open it too rarely and the same problems occur as have happened in the 6-year gap between Phase III and Phase IV being set. Monthly or quarterly reporting, as practiced by most central banks for interest rate decisions, would likely to be too frequent. Instead, a 2- or 3- year review cycle, with changes only possible on the basis of pre-determined criteria, would best strike the balance between long-term stability and responsiveness to changing circumstances.

Creating an Independent Agency under EU Laws

As well as the question of whether an independent ETS institution is desirable, there is also the question of its legal underpinning. Recently, CEPS attempted to identify ways in which such an agency could be established and the legal procedures that would be required. It identified challenging barriers, most notably the need for unanimity among member states (exercised either through the European Council or through separate intergovernmental agreement). Creating an agency empowered to change the cap would require amendment to the EU Treaty. A more limited role, such as making operational decisions (backloading, for instance) that do not change the cap, would not require the Treaty to be reopened.

Egenhofer concludes that the most feasible way of resolving the problem would be an Agency to govern an 'automatic economic adjustment' mechanism that responded to economic circumstances at fixed points and would "calculate supply based on *ex ante* rules and procedures" such as those described in the first half of this Chapter (Egenhofer, 2012). It would then fall on either the Commission or the Parliament and Council in combination to authorise the recommendation emerging from the Agency. This falls some way short of the goal of true independence, but does have the potential to make the ETS more adaptable to changing economic circumstances.

Options

This Chapter has considered four possible options for institutional reform within the ETS (Table 5.1).

Table 5.1: Institutional Reform Options for the ETS

	Institutional arrangement	Treaty considerations
More independent	**Independent agency with cap-adjustment powers (Central Bank model):** Agency can decide when cap adjustment or permit management should occur. Could have full institutional discretion or pre-determined rules for intervention. Adjusting cap would not require member state approval.	Highest legal obstacles to establishment (requires Treaty amendment to establish Agency): • Would need unanimous approval from other member states • Arduous ratification process • Highest level of independence once established
	Independent agency with advisory role (CCC model): Agency decision making on when cap adjustment or permit management should occur. Could have full institutional discretion or pre-determined rules for intervention. Adjusting cap would still require member state approval.	Some legal obstacles to establishment (requires Directive amendment to establish rules): • EU precedent restricts delegation of powers from principal institutions. Agency could advise Commission or Council, but would need their approval to implement recommendations. • Council and European Parliament cannot delegate powers they do not have – would that be enough for an independent agency to work effectively?
	European Commission operating with pre-determined rules about intervention: Commission decision making on when cap adjustment or permit management should occur. Pre-determined rules for intervention. Adjusting cap would still require member state approval.	
Less independent	**European Commission operating as now (no change option):** Commission decision making on when cap adjustment or permit management should occur. Institutional discretion for intervention. Adjusting cap requires member state approval.	No legal obstacles to establishment.

The current system, with its many opportunities for blocking intervention, has meant that changing the ETS mid-phase is exceedingly difficult. Independent decision making would remove one of the major barriers to intervention. To ensure that the predictability of the policy is not lost, a move towards more institutional independence must come with some guidance for market participants about when intervention could be considered, along the lines of the measures described in the first half of this Chapter.

A fully independent agency in the mould of the "Carbon Bank" proposal has many merits, but the obstacles to establishing such a body are prohibitive. An independent agency with the power and institutional credibility to make weighty recommendations, in the manner of the UK Committee on Climate Change, is the best politically feasible option. Its recommendations would still have to go through Member State approval – such a hurdle is unavoidable – but as the scope for its interventions would have been negotiated in advance, approval should be less politically contentious.

Conclusions

The slack under the current ETS cap has resulted, in significant part, from its inability to adjust to changing economic circumstances. The 'business as usual' case turned out to be highly inaccurate in the wake of the financial crisis. Without any straightforward means of changing course, the ETS risks becoming redundant. This has put its political credibility and policy utility in jeopardy. The current, highly politicised process for intervention has been demonstrably incapable of proving clear signals. While the choice of the ETS as the means of decarbonisation is rightly a political one, reducing the role for political haggling

in the operational decisions about the ETS is imperative. An independent agency, with clearly defined rules about when and how it can intervene, provides the best balance between the need to keep the ETS stable and providing longer-term investment signals and ensuring that decisions taken about its directions years earlier are able to keep pace with world events.

A body with advisory powers similar to the UK Committee on Climate Change provides the best balance between independence and political feasibility. Final decisions on cap adjustment would still require European Parliament and member state approval.

The rules governing when and how the new institution would propose changes should be robust. These trigger points for when market intervention will occur should be established *ex ante* to allow market participants to anticipate and plan for changes. The duty of the new institution would be to adjudicate whether the conditions for change have been met, and propose appropriate remedies commensurate to its assessment of the scale of the problem. The review process should operate on a clearly defined timetable. A 2 or 3-year review cycle would best strike the balance between long-term stability and responsiveness to changing circumstances.

Specific price outcomes should not be the motivation behind cap management, but if the proposals in this Chapter to boost the role of the ETS were adopted, they would likely put pressure on the ETS for prices to rise. It should also help reinforce the credibility of the ETS as a whole, if it means price collapses and subsequent calls for the disbanding of the ETS can be avoided. While this would be helpful pre-2020, it must be a core component of any post-2020 settlement, settled alongside the ambition for the cap, which was discussed in Chapter 4.

Reorganising institutional arrangements is not be a substitute for political will to tackle carbon emissions in a credible and cost-effective manner. The recommendations of the institution to withdraw or increase the number of permits in the system, as proposed in this Chapter, would need to be approved by MEPs and Member States. These institutional reforms will not fool the market into thinking it is more politically sustainable than politicians allow to be. It will only be useful if it is deemed a credible foundation of the carbon market's long-term reliability.

Establishing such a body would create a clear political commitment to the survival and importance of the ETS. The rules guiding when it can and cannot intervene, as well as the regular schedule of reviews, will improve the message to participants in the market over the current arbitrary and chaotic arrangements. But it will not remove the need for politicians to accept and support a well-functioning market to reduce emissions over the decades to come.

Recommendation

- The EU should establish a new agency to provide independent advice on cap management decisions. Rules governing conditions under which the cap is changed, and establishing a regular 2 or 3-year review cycle, should be specified in advance, at the same time as the agency is established. It should establish transparent procedures for releasing conclusions and minutes of meetings and setting dates for decisions in the manner of a central bank.

6
Other Interventions

Concerns that a reformed ETS will harm economic activity have motivated much of the opposition to strengthening the ETS. Concerned that rising carbon costs will put them at a competitive disadvantage compared to non-EU rivals, some industrial lobbyists have put pressure on politicians to leave the ETS cap relatively loose. Politicians, rightly worried about impacts on employment, have unsurprisingly proven sympathetic. However, this lobbying has had a perverse consequence, as the weakened state of the ETS has been used by politicians to justify other energy policy interventions, at much higher cost (as we shall see in the second half of this Chapter). The first half will look at the questions of whether industry has good reason to be worried about ETS reform and how it has been affected by the system to date.

Competitiveness Impacts

Because the ETS only covers greenhouse gas emissions from facilities within Europe, there has been a persistent fear that, as it becomes more demanding, it will lead companies to relocate industrial activity outside the EU. This fear is partly motivated by economic concerns – that such a transfer would lead to a loss of both jobs and production. At a time when economic growth is fragile, imposing additional costs on the economy may be politically risky. There is also an environmental concern – that it would lead to worse environmental outcomes, as companies move their most polluting work to places with weaker environmental regulation.

The impact of the ETS and wider climate policy on Europe's economy has been a major source of controversy. Furthermore, several proposed policy approaches entail serious downsides that could have worse outcomes than the problem they are intended to address.

Carbon Leakage In Theory and In Practice

The theoretical concerns about carbon leakage and its impact on industrial competitiveness are relatively straightforward. Firms in a location where greenhouse gas emissions are priced bear an extra cost in comparison to firms in locations where GHG emissions are not priced. This "would enhance the competitiveness (i.e. international market share – exports and imports – and profit levels) of non-carbon-constrained producers (e.g. in China)" (Reinaud, Climate Policy and Carbon Leakage, 2008, p. 6). Firms bear direct costs to acquire permits or improve facilities to account for pollution from their own processes. In addition, there are indirect impacts as industrial firms may also be affected by

rising electricity prices caused by climate policy. The impact on competitiveness will vary between sectors as their electricity intensity and trade exposure, and ability to pass increased costs on to customers varies.

Complicating the debate, though, is the shortage of evidence of carbon leakage in practice. There are several reasons for this. Disentangling where movement of economic activity out of Europe has been caused by carbon policy from that motivated by other economic trends, such as the relative costs of labour or the cost of transporting goods, is very difficult. Even in instances where energy costs are the biggest contributor, those cost differentials are not necessarily the result of climate policy, but the result of developments like the US shale gas boom (Birnbaum, 2013). Implementation of the ETS has also included protections for industry, including the free handout of permits described below, making it difficult to extrapolate the impacts of a reformed ETS.

Nonetheless, some studies have attempted to quantify the problem. A 2012 assessment, looking solely at the aluminium sector found that, despite rising electricity costs, "no evidence of carbon leakage can be detected so far" (Sartor, 2012). Similar (though earlier) studies also found that the ETS "has not triggered changes in trade flows or production patterns for cement products, iron and steel, refineries or aluminium." (Reinaud, Trade, Competitiveness and Carbon Leakage: Challenges and Opportunities, 2009, p. 9) (Reinaud, Climate Policy and Carbon Leakage, 2008). On the other hand, studies surveyed by Ricardo-AEA estimated that 5-30% of emissions reductions due to EU climate policies would be cancelled out by carbon leakage (Varma, Milnes, Miller, Williams, de Bruyn, & Brinke, 2012, p. 71).

Arguments about the threat of carbon leakage are central to heavy industrial lobbying against ETS reform and tightening the cap. However, governments must be careful about how they respond. Until there is clear evidence of leakage, they should be cautious about implementing generous compensation measures that transfer resources to heavy industry from other parts of the economy.

Free Allocations and Auctioning

Phase III expands auctioning for permits. In Phase II, a handful of countries opted to auction permits, but in each case the number of permits auctioned was less than 10% of the country's allowance. In Phase III, the European Commission expects to see around 60% of permits auctioned, including near-full auctioning to the electricity sector (electricity generation has no risk of being moved overseas if carbon compliance costs are high). By 2027 the ETS intends to have reached 100% auctioning of permits in sectors not at risk of carbon leakage (Department for Energy and Climate Change, 2013).

Free allocations were introduced in response to the concerns about the impact of introducing carbon pricing unilaterally in the EU. They were designed to compensate firms for the impact of the policy on their competitiveness (as well as providing an inducement to support the Scheme).

The EU has attempted to quantify the economic effects of increased auctioning in the ETS. Its modelling estimated that continuing with current levels of free allocation would see GDP 37.5% higher in 2020 than in 2008, versus 38% higher with no policy. In contrast, it found that full auctioning would see GDP 37.65% higher than today in 2020 (the EU assumed the government appropriation

and spending of auction revenues would lead to a net increase in GDP – not all economists would support this assumption). Given the changes to assumptions that would have resulted from the financial crisis that occurred shortly after these estimates were published, the precise results should be treated with caution. However, the broader conclusions in the Impact Assessment still have relevance, in that "the macro-economic impact of auctioning largely depends on how revenues are recycled back to the economy." In other words, governments need to spend the proceeds efficiently in order to achieve the maximum benefit. (European Commission, 2008).

Another consideration is distributional. Free allocations of permits to industry represent a transfer of resources from the rest of society to the beneficiary industries. This can have a regressive impact (Dinan & Rogers, 2002).

The move to auctioning has not begun smoothly either, suffering from the low demand for carbon allowances. Before the end of February 2013, two scheduled auctions in Germany had to be abandoned when the price offered to the government seller at auction was lower than the price available in the market. The lack of demand resulting from a loose cap and companies having large permit stockpiles has reduced the need for companies to make acquisitions at auction.

The move to greater use of auctioning in Phase III has left finance ministries more directly affected by the ETS carbon price. As expectations about future EUA prices have fluctuated, so have government revenue projections. Figure 6.1 shows how expectations of government revenue from the ETS in the UK have evolved over time.

Figure 6.1: Changes to projected UK government revenue from ETS auctioning over time

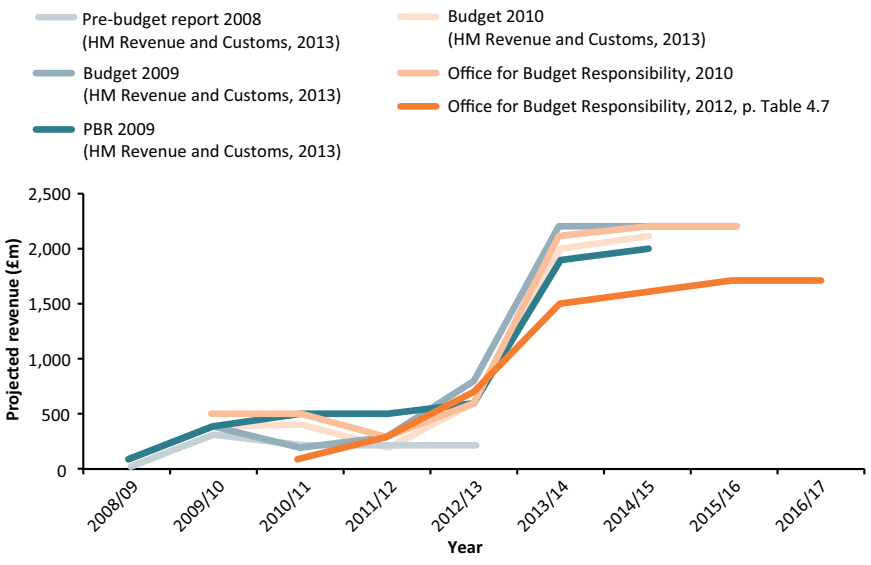


Figure 6.1 shows how the UK Government's most recent estimate of ETS auction revenues has dropped off substantially from its previous assessments, by around £0.5 billion per year from their 2009 peak. The UK government has taken steps to shore up this revenue stream. It has chosen to deal with concerns about low auction revenues and a weak carbon price signal to investors with the introduction of a carbon price floor (CPF) on fossil fuel electricity generation in

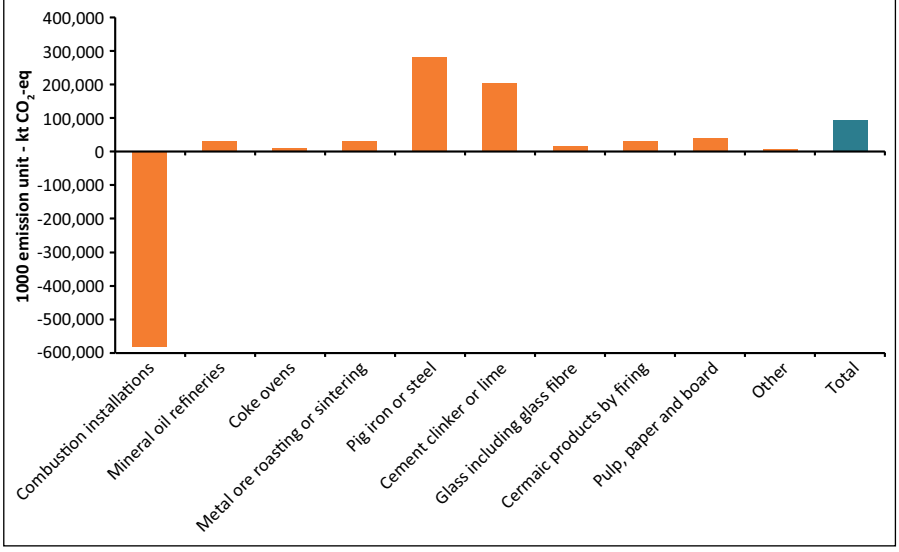
2013. This will ensure that the ETS price plus the price support will reach £30/tonne in 2020 and £70 in 2030. In so doing, the UK government has also moved away from the single pan-European price for carbon in sectors covered by the ETS. However, because the CPF only covers sectors already capped under the ETS, any emissions cuts in the UK that result from it will be cancelled out by increased emissions elsewhere in Europe.

Moving to full auctioning of permits would end the windfall benefits currently accruing to some firms. However, the large stockpiles of permits handed out freely in the previous trading period that many firms now hold, combined with the 40% of permits that will still be given away in the future, means that some firms are still beneficiaries of handsome windfalls from the ETS.

Stockpiles

While industrial companies complain about the risks to their business of the ETS, they have also been able to benefit from it financially. Many firms have accumulated large stockpiles of emissions permits over the course of Phase II, collectively worth hundreds of millions of Euros. The steel and cement sectors are by far the biggest beneficiaries (Figure 6.2). Over the course of the second trading period, those two sectors have received nearly 500 million tonnes worth of permits more than they needed for their own emissions (worth about €2.5 bn at €5/tonne, and potentially worth around €7.5 bn if prices recover to €15/tonne). These can either be sold on to other sectors (almost entirely combustion installations (i.e. electricity generators) in a handful of countries) or banked for use or sale in future periods.

Figure 6.2:- EU ETS Permit Allocation Minus Verified Emissions by Industrial Sector (Total, 2nd Trading Period)

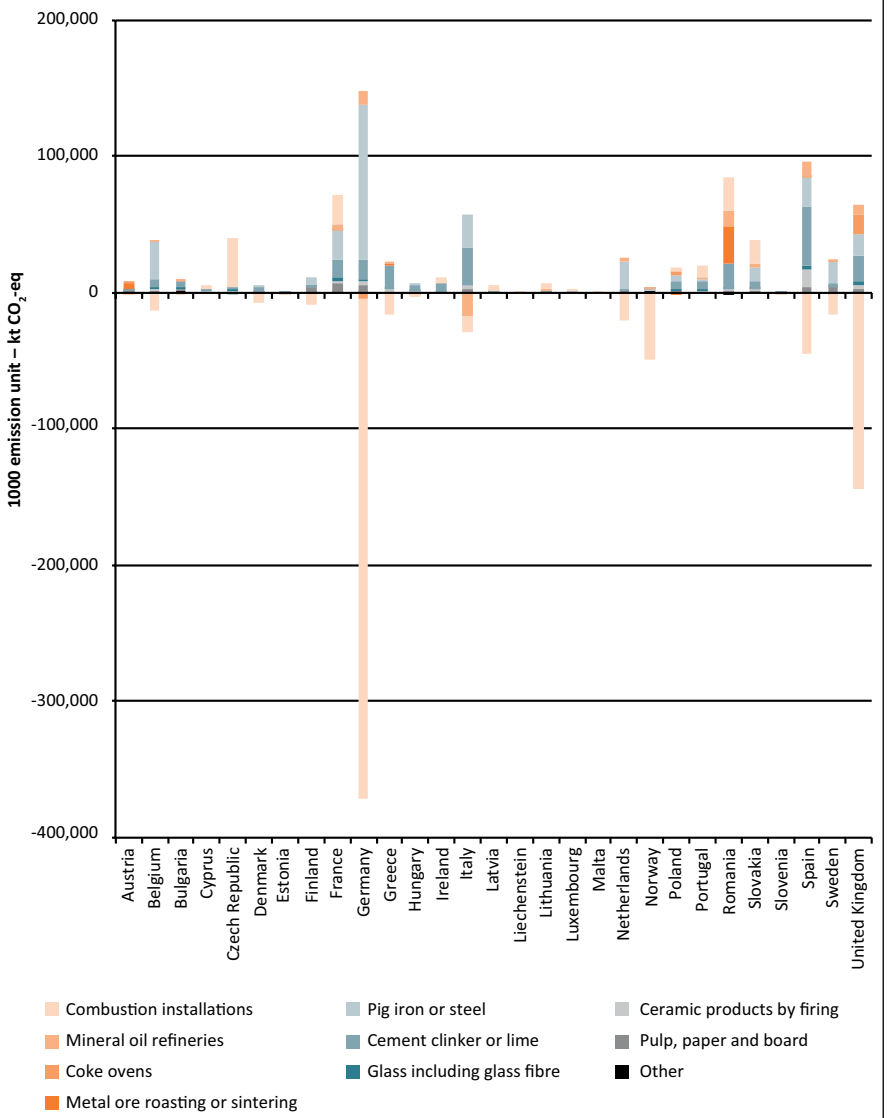


Figures 6.3 shows the geographic and industrial distribution of these surpluses (shown throughout as the volume of verified emissions subtracted from the number of freely allocated permits in the 2nd trading period). Steelworks in Germany, cement factories in Spain and metal ore operations in Romania are among the biggest national industrial sector beneficiaries. Electricity generators

across Europe account for virtually all demand in the system, with German and British generators having to acquire most allowances in the market.

Ten steel and cement firms collectively hold more than €4 billion in freely distributed permits not needed to cover emissions (Sandbag, 2011, p. 6). These firms are able to bank these for later use or sell them in the market. The biggest holder of permits, Arcelor Mittal, has a stockpile of 123.2 million permits (valued at current prices at €0.6 bn, and if prices recover to €15/tonne these would be worth €1.8bn) – that in a company with a market capitalization of around €20 bn.[11] Since the demand for buying permits in the ETS marketplace comes almost exclusively from power companies, European power consumers are effectively granting one of the world's largest companies a billion Euro windfall.

Figure 6.3: EU ETS permit over-allocation by country and industrial sector (total, 2nd trading period)



11 As of December 2012

Figure 6.4: National oversupply and oversupply per unit of GDP (2nd trading period)

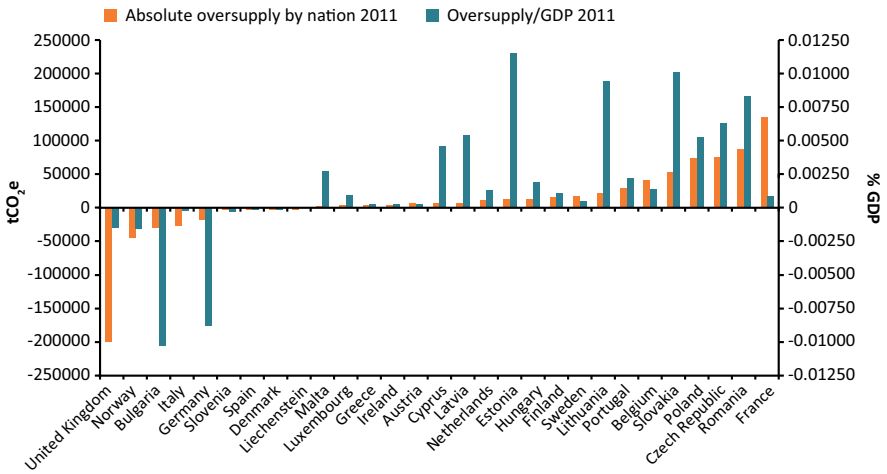


Figure 6.4 compares the absolute oversupply of permits per ETS member and their value as a proportion of the countries' GDP. It shows that, while the UK and Germany have to buy in the largest volumes of permits from other countries, as a proportion of GDP these costs are still relatively small. In contrast, although Bulgaria's volume of demand for imported permits is much smaller, it takes up a much bigger proportion of its GDP. On the other side of the ledger, while the volume of allocations to Estonia, Lithuania, Slovakia and Cyprus was relatively small, in comparison with the total size of their economies they have been allocated permits far more generously than Poland and France, who receive the biggest overallocation in absolute terms. The grouping of smaller nations have perhaps the most to lose from reform of the way permits are allocated.

While one might be able to justify free allocations to meet trade-exposed industrial firms' needs to cover their emissions, the over-allocation shown in these charts demonstrates how EU member states have tended to overcompensate. They have not just handed their firms enough allowances to defray the costs of compliance with the ETS; they have also handed them millions of extra permits that can be sold to others, making them pure profit for the firms concerned. Phase III sees a move towards more auctioning, and towards a centralised European method for allocating free permits. Hopefully, this will scale back the generous over-allocation which has damaged the ETS until now. However, given the degree of oversupply already in the system, the effect of these reforms will be weakened.

Border Tariffs

The EU has been at the forefront of international negotiations to encourage other countries to implement some form of carbon pricing, which would help reduce the imbalance between the EU and the rest of the world. But there are obviously limits to what the EU can do in this area. The key decisions are in the hands of other countries and the politics, particularly in the US and China, appear even

more sensitive to carbon leakage and competitiveness arguments than in Europe. As a result, some have asked whether the EU should add to the carrot of linking ETSs with a stick to punish countries without carbon prices in place. A charge on imports from non-carbon priced locations, some have suggested, would fill this role (Helm, 2012, pp. 190–194).

Applying a carbon price to imports is appealing for the same reasons as for pricing domestic emissions – it corrects the environmental externality of greenhouse gas pollution. However, fitting border taxes with existing climate policy structures is challenging. Helm would tackle this problem by sweeping aside most existing climate policy institutions (including the ETS). Such a revolution shows the difficulty of combining the principle of border tariffs with the practicalities of the current framework, with its emphases on production rather than consumption of emissions and on limiting emissions quantities rather than prices. It has a number of risks (Stern, 2006, p. 487):

- Assessing the carbon content of imported products is difficult, if not impossible, though targeting energy intensive industries (perhaps the same sectors as the ETS covers) would make it simpler. For imported finished goods, it would be even more difficult, given the complexity of global supply chains. A vehicle made in Malaysia using steel from energy-efficient Brazil ought to be charged differently than one using steel from energy-inefficient Russia. Applying this principle in practice would be very difficult.
- This approach would risk tit-for-tat retaliatory trade responses. Carbon-correcting trade tariffs would probably not contravene WTO guidelines, so long as they were applied in a non-discriminatory way (Pauwelyn, 2009). Nonetheless, the experience of aviation in the ETS has already shown the difficulties of applying the ETS to foreign operators. For operations that are completely outside the EU, the perceived threat to sovereignty and arguments against overreach will likely be even more.
- It risks being used as a pretext for anti-trade policies that have less to do with carbon than with normal protectionist impulses. Some EU Member States have a tendency towards protectionism; giving them any more of an excuse could have damaging repercussions for free trade.
- Barriers to trade are generally economically inefficient, and could have particularly damaging effects on developing countries who rely on carbon-intensive exports.
- Unilateral imposition of tariffs may undercut the building of trust needed to establish a global carbon-pricing regime.

Because of the large disparity between emissions per unit of output in the West and in manufacturing centres of China and India, an effective carbon tariff would have to set at a high level. Mattoo and Subramanian estimated an appropriate carbon price equivalent to Western policies achieving a 17% emissions cut on 2005 levels by 2020 would require a 21% tariff on Indian goods and 26% for those from China (Mattoo & Subramanian, 2013). They estimate that this would cut Indian exports by 16% and Chinese by 20%. Such punitive rates would lead to a 1% decline in global welfare by suppressing trade. Their solution – a tariff based on the level of carbon in domestic production with a rebate for domestic exports

– is perhaps simpler, and has lesser impacts on world trade, but disconnects the policy from emissions. The complexities of any trade barrier approach are obviously significant.

A further lever the EU could choose to exploit is its status as the world's largest trading bloc. By linking free trade negotiations to climate policy, it could attempt to exchange access to its markets for climate policy that would reduce risks of carbon leakage. However, there are big risks involved with such a strategy, including the risk that otherwise-beneficial trade agreements would be scuppered by failure to resolve the climate policy problem.

The EU is currently in negotiations with the following countries and trade blocs (European Commission, 2013):

- ASEAN (Burma, Brunei, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, Vietnam)
- Canada
- Gulf Co-operation Council (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates)
- India
- Malaysia
- Singapore
- Ukraine
- USA (negotiations scheduled to begin in June 2013)

These negotiations all provide an opportunity to encourage progress on greenhouse gas emissions. Any of those free trade agreements that cover carbon-intensive industries ought to be linked to progress on policies to control emissions.

Recommendations

Balancing environmental effectiveness with economic impacts is one of the hardest tasks in running the ETS. While some worries about competitiveness are justified, it is important not to overcompensate by being too generous to the polluters the ETS was set up to restrain. Previous ETS reform efforts have attempted to address many of the problems highlighted in this Chapter, so what is required in many cases is to proceed with implementation of current plans, rather than further dramatic overhauls.

First, the ETS should **continue to move towards full auctioning of permits. Phase IV should aim to achieve 100% auctioning of permits, though any possibility of speeding up this process should be pursued.**

Second, the ETS should **continue to encourage the adoption of ETS or carbon pricing policies in other countries and to facilitate links between the EU ETS and other schemes.** The more of the world that is brought under a carbon price, the less scope there is for carbon leakage. This has the potential to be a virtuous cycle as the lower scope for carbon leakage reduces the objections of others. The EU should look to use its position as a leading trading bloc to encourage progress on greenhouse gas emissions, for instance by linking **free trade agreements covering carbon-intensive industries to substantive progress on policies to control emissions.**

Finally, worries about the impact of the ETS on European firms' competitiveness risk distracting from the harm caused by less cost-effective climate policies, which impose much greater costs on European energy consumers for the amount of carbon they reduce. Lowering those costs should be a higher priority. The rest of this chapter will look at those policies in more detail.

Interaction with EU renewable and energy efficiency policies

Interactions between the ETS and other EU and Member State energy policies have weakened the price signal that the ETS delivers. The EU's '20-20-20' energy package instituted three targets. The first, a target for a 20% reduction in EU greenhouse gas emissions from 1990 levels by 2020, is directly linked to the ETS cap that has been discussed throughout this paper. The other two – raising the share of EU energy consumption produced from renewable resources to 20%, and a 20% improvement in the EU's energy efficiency, again by 2020 – undercut the carbon pricing system, to achieve other objectives deemed politically valuable. However, these other two targets have no intrinsic merit in terms of addressing climate change, and they threaten real damage to the ability of the ETS to give a clear carbon price signal. Now, the European Commission is contemplating introducing a new renewable energy target for 2030 (Keating, 2013).

Environmental performance can be improved in the presence of renewable energy targets by tightening the cap commensurate to the amount of renewable energy expected to be forced into the traded sector by the renewables targets. However, this benefit could be achieved by tightening the cap without the renewables targets – the cap-tightening is the part that improves environmental performance under a cap-and-trade system, not the renewable energy target. The problem of renewable energy targets being less cost-effective than the outcome of the ETS is only corrected if the cap is tightened sufficiently that renewable energy projects become more affordable than emissions from polluting alternatives, in which case the renewable energy target is redundant because the ETS will already drive those projects. Renewable energy targets accompanying a cap-and-trade system can either be cost-ineffective, because they force more expensive abatement than the marginal ETS price, or redundant, because they force abatement at the same cost or lower than the marginal ETS price. But, while they will not reduce emissions, they will get renewable energy projects built. Clearly that alone is what some politicians want, but when it has no environmental effect, there is no good reason to support it.

> "The energy demand reductions required by the Energy Efficiency Directive (EED) reduce the work that is required by the ETS to push decarbonisation"

The introduction of binding targets for renewable energy (and energy efficiency) yields a different outcome from the cost effective solution generated by a comprehensive emissions trading system (Böhringer, Rutherford, & Tol, 2009, p. 269). To the extent that the renewable energy target is reached in sectors covered by the ETS (most obviously electricity generation) it reduces demand for permits. To the extent that the renewable energy technologies mandated are more expensive (per tonne of carbon saved) than the marginal price that would have

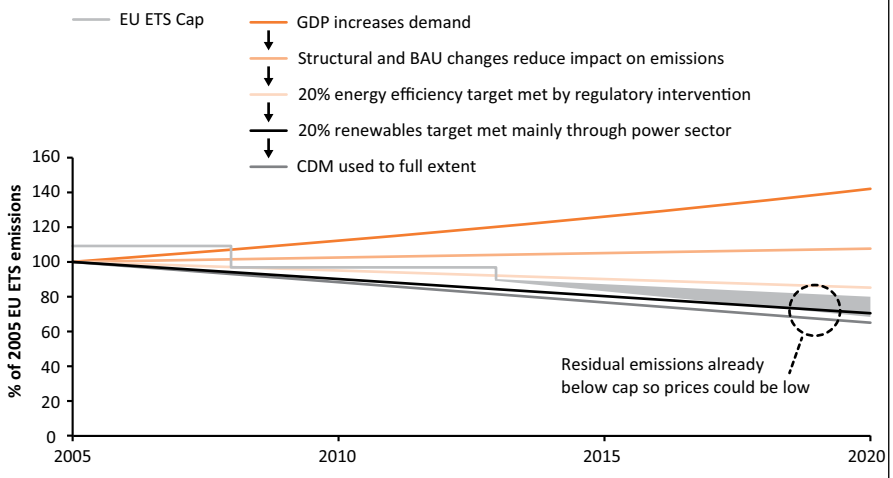
delivered equivalent emissions saving under the ETS, they represent an additional cost for reducing emissions by the same amount.

Likewise, the energy demand reductions required by the Energy Efficiency Directive (EED) reduce the work that is required by the ETS to push decarbonisation. One would expect energy efficiency policies to be less damaging, as efficiency measures are often (though by no means always) the cheapest abatement options. Still, taking decisions about energy efficiency out of the ETS removes the ability of the system to generate information about the relative costs of efficiency and other abatement options, which is one of the main advantages of a market-based system. The EU's Impact Assessment of the EED found that in certain circumstances (i.e. when energy efficiency directed was pursued mostly within ETS traded industrial sectors) it would drive the carbon price to €0 (European Commission, 2011, p. 30).

Consultancy IHS CERA has found that "when one considers the decline in emissions attributable to the 2008–09 economic recession, the fragile recovery thereafter, and the further reduction in emissions associated with the as yet unresolved sovereign debt crisis, on top of...offset credits...the realization of the renewables and efficiency policies would bring CO_2 emissions well below the ETS market cap." (IHS CERA, 2012).

This is illustrated graphically in Figure 6.5, reproduced from the Carbon Trust (Carbon Trust, 2009). While the originally-assumed business-as-usual case would see emissions steadily rising with GDP, the cumulative effect of structural economic changes, renewable energy and efficiency policies, and cheap offsetting pull the residual volume of emissions beneath the level of the cap. What were at the time of the report considered generous assumptions about structural/BAU decarbonisation have largely materialised as a result of the recession (at least in the period from 2009 to now).

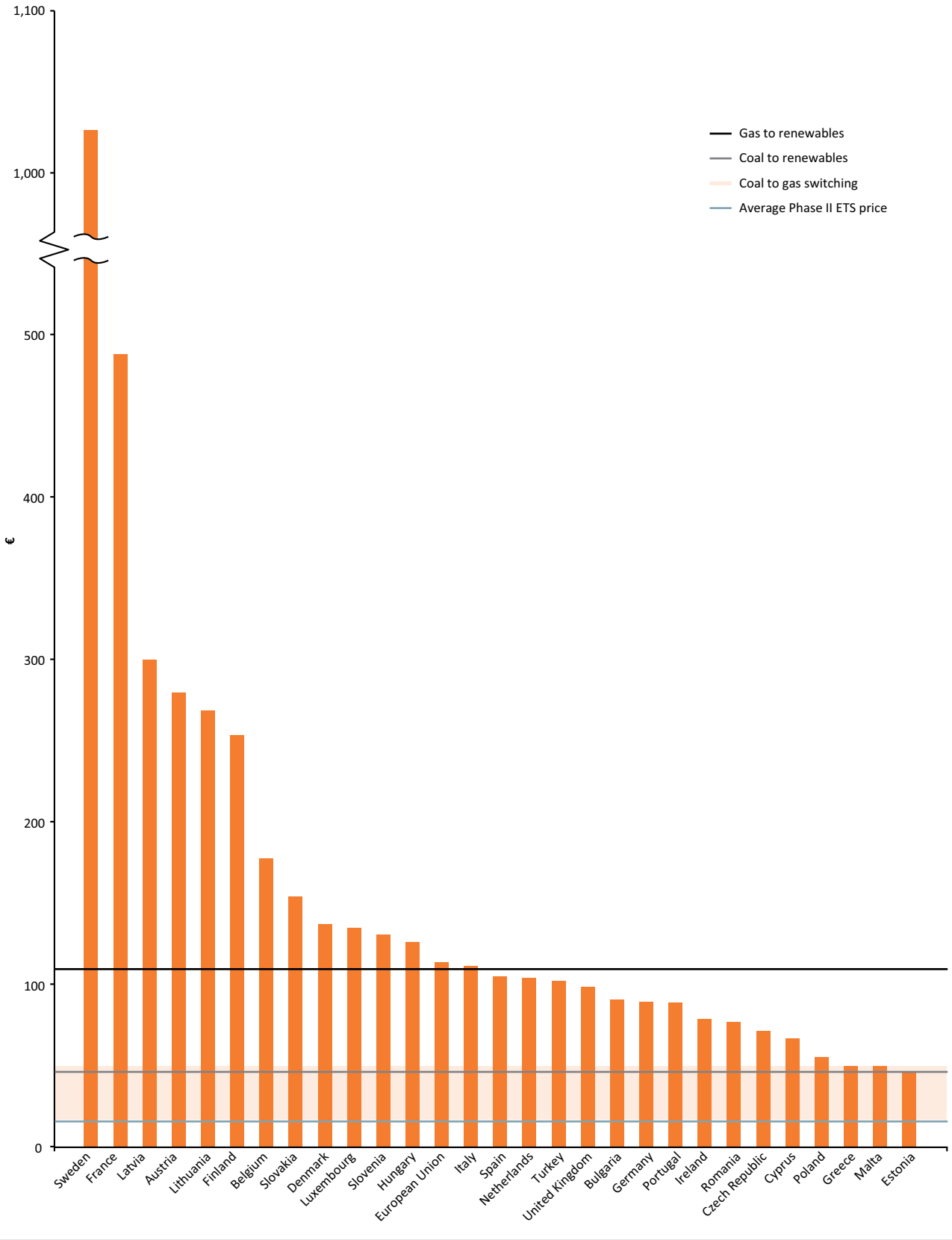
Figure 6.5: Influence of other climate policy on achieving the ETS cap



The EU estimated that the effect of the renewable energy target would be to reduce the carbon price in 2020 from €49/tCO_2 to €39/tCO_2 (European Commission, 2008, p.p. 35). Its modelling estimated a maximum needed

12 Assumes carbon intensities of 0.411 tCO2/MWh for gas generation and 0.971 tCO2/MWh for coal (ICIS).

Figure 6.6: Cost per tonne of carbon saved by Renewable Energy Target



renewable energy incentive of €45/MWh. It is useful to examine how closely this prediction has related to reality after 5 years of the target.

The cost-effectiveness of this varies across Europe given different countries' different average carbon intensity of electricity and differing renewable energy opportunities. Policy Exchange has estimated the cost per tonne of carbon saved by the renewable energy target using those Commission estimates (data from 2009, European Environment Agency, 2011), dividing the estimated subsidy of €45/MWh by the average carbon intensity of electricity in each country (tCO_2/MWh) to give an estimate of cost effectiveness (€/tCO_2 saved). In the UK, the RET would cost roughly €90 per tCO_2 saved; in nuclear-dominated France, it becomes an extraordinary €487 per tCO_2 saved (Figure 6.6).

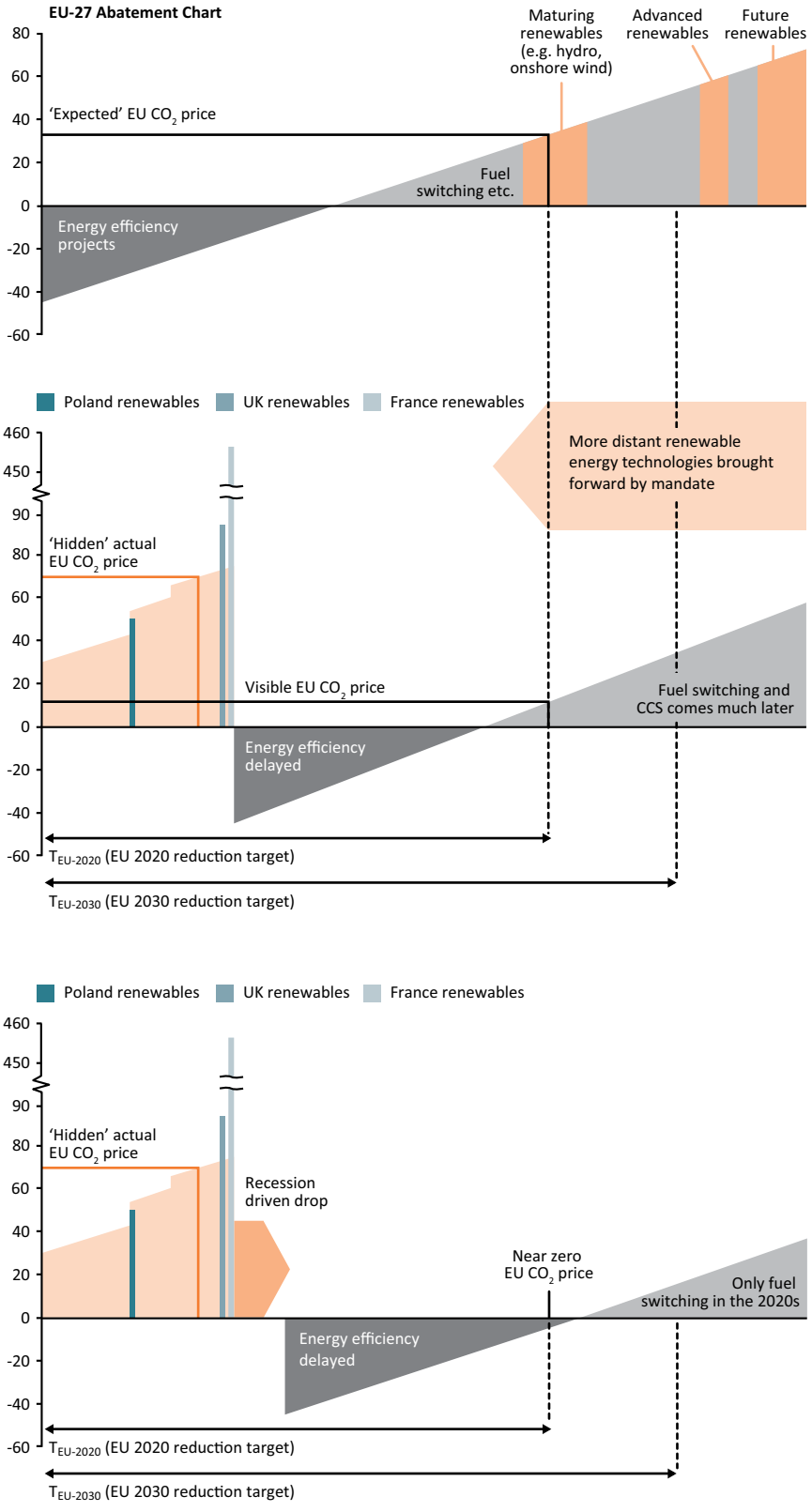
These figures are approximations – they do not factor in merit order and time-of-day effects that will alter the carbon intensity of electricity displaced by renewable generation. They also use the very optimistic €45 subsidy figure as presented by the Commission and do not reflect the differing costs of renewable technologies being supported in each country (for example, offshore wind subsidy in the UK costs two to three times that estimate; solar PV is even more expensive (Mott MacDonald, 2011)). If the marginal plant displaced by RES has above-average emissions for the country, the cost per tonne of carbon saved of RES policies will be lower than the average figures used. However, if a country's renewable energy sources require higher subsidy than the assumed €45/MWh then the costs will be higher. For comparison, the average ETS carbon price in phase II, and estimates of the cost-effectiveness of displacing coal and gas respectively with renewables at €45/MWh, are also shown.[12]

When the Renewable Energy Target was being brought in, officials thought it would require EU Member States to spend €100 (or in the most extreme case, over €1000) per tonne of CO_2 to avoid paying a €49/tonne carbon price. This was a poor deal at the time and only looks worse as the carbon price has been significantly cheaper.

The effects of this are shown in Figures 6.7 to 6.9 (from Hone, 2013). Bringing forward deployment of renewables by fiat has had the dual effect of lowering the (visible) ETS carbon price, while simultaneously forcing consumers to pay for a much higher 'hidden' carbon price-equivalent in renewable energy subsidy programmes. In such a policy ecosystem, the ETS has become the 'backstop' for other policies (renewable energy targets, national emissions performance standards, etc.), only having an effect where other policies prove insufficient, rather than being the 'backbone' carrying the main weight of decarbonisation. When the effects of the recession is combined with that of the renewable energy target and extensive offsetting, low ETS prices are the consequence. Some non-renewable energy low-cost abatement options (coal-to-gas fuel switching, efficiency) are pushed back in time as more expensive renewables are forced to be deployed before 2020.

It is not only the existing renewable energy target that can have an impact on the price delivered by the ETS. Expectations of a further renewable energy target for 2030 will reduce the value of banking emissions permits for use in the 2020s. If, again, more of the emissions reduction effort in the future are taken up by policy mandates and less by the ETS market, the less value permits will be expected to have in the future.

Figure 6.7-6.9: Renewable Energy Target and Energy Efficiency Target Reduce Visible Carbon Price while Raising 'Hidden' Carbon Price-Equivalent



While the argument that the renewable energy target is a cost-effective approach to decarbonisation is demonstrably untrue, other arguments have arisen in support of setting renewable energy targets. The security of supply case for renewable energy targets is based on the questionable proposition that European weather is more reliable than the governments of major energy exporters. Others contend that renewable energy targets are necessary to support innovation, though this neglects that deployment targets require the use of currently available technologies, not those that may result from innovation processes in the future, and also neglects that policies (carbon pricing, early stage innovation support) could offer a preferable means of supporting innovation.[13] A complete assessment of the case for renewable energy targets can be found in *Policy Exchange*'s report 2020 *Hindsight* (Moore, 2011).

Decarbonisation is a difficult and costly enough process as it is, without forcing the use of technologies that are more expensive than is necessary. The current approach is like being given £1,000 to feed as many people as possible and starting by ordering caviar. Squandering money on hugely expensive renewable energy projects is an unaffordable and wasteful luxury. There is no point choosing a policy, like the ETS, designed to find the cheapest carbon reductions, and then insist on expensive carbon reductions through technology-specific targets which are unresponsive to the costs involved.

As Hepburn reflects, "the use of multiple instruments to address a single problem almost certainly reflects an *ad hoc* policy accretion process driven by the multiplicity of national institutions. Multiple instruments may also reflect the temptation of politicians to 'fix everything' – both price and quantity – even when policy is generally best served by fixing one and letting the market determine the other. Multiple instruments are problematic when they are inconsistent with each other and can result in perverse consequences if the interactions between different policies are not carefully considered" (Hepburn, 2006) The purpose of opting for a market based process was to avoid political decision making of this kind – which had led to a weakened market beset by chronic political intervention.

Recommendations

Renewable energy targets have had a damaging and distorting impact on European climate policy. They have undermined the principle policy for reducing carbon while adding hefty sums to consumer bills. They have done so while making no net saving of carbon, simply substituting more expensive ways of reducing emissions for cheaper ones. **The EU should abandon its renewable energy target for 2020, and should not make include a renewable energy target in any package for 2030 or beyond.**

If politicians do not believe the ETS gives a sufficient signal to low carbon technologies in the first instance, their focus should be on strengthening the ETS in the ways described elsewhere in this report. Additional policy should be aimed at sectors not covered by the ETS (in its current form, that would include, for example, transport and heating) where policy can achieve *additional* emissions cuts rather than imposing politician's preferences of technology on achieving the same level of reduction.

If there is to be a role for an EU-wide renewables policy after 2020, it should not be in the form of a deployment target. Effort would be better focused on

13 Policy Exchange intends to look in more detail at the issue of innovation support policy for new energy technologies in a future report.

earlier-stage innovation support and demonstration rather than mass deployment. This would minimise the interference between renewables policy and the ETS, while also shifting the balance of subsidy away from mature-but-expensive technologies toward less mature ones (Moselle, 2011).

Again, politicians need to trust in the ability of the ETS to do its job. Although Hepburn is right in saying that, "policies often involve a plethora of different instruments, such as command-and-control regulation, subsidies, taxes, trading schemes, negotiated agreements, and information campaigns," this is an undesirable outcome of political indiscipline and lack of faith in their own policies. This multiplicity of instruments should be reduced as far as possible.

7
If the Cap Doesn't Fit: Carbon Taxes as a Backup Plan

Some critics argue that cap and trade is itself flawed. They argue its complexity, volatility, and susceptibility to industry lobbying means it would be better to replaced the current system with a mechanism that would provide a clearer carbon price signal. This Chapter will look at the pros and cons of moving towards a carbon tax.[14] If reform of the ETS, as recommended in the preceding chapters, proves too difficult, should the EU re-consider its choice of cap-and-trade over carbon taxation and in what circumstances should this decision be revisited?

In principle, a policymaker can either target a level of environmental ambition (in the form of the cap on greenhouse gas emissions) and use a cap-and-trade market to discover the cost of achieving it. Or, they can impose a specified price (tax) on greenhouse gas emissions, and discover what environmental result is achieved. In economic theory, at least, the two should produce equivalent outcomes. In practice, however, the political and economic implications differ.

Economic Arguments

Signal Duration

The ETS has a formal cap set until 2020, and a commitment of a 1.74% rate of emissions reduction that must be reviewed before 2025. Chapter 4 discusses the advantages of providing a longer-term cap.

A carbon tax, on the other hand, as usually conceived, would have no defined endpoint. Instead, the durability of the signal it provides would depend on the unwillingness of politicians to remove a source of revenue. While revoking taxes is unusual, as Yarrow points out, it is not unprecedented. "If a tax is silly or dysfunctional enough, even cash-hungry governments may abandon it" (Yarrow, 2012, p. 2).

Providing a long-term signal is an important feature of any climate policy. One of the weaknesses of the ETS until now has been that the signal it has provided has not been sufficiently long-term to match the investment schedules of major energy infrastructure projects. But this is a problem that can be solved within the existing structure. While it may be conceded that the ETS (in its current form) has delivered a short-term signal, there is no guarantee that a tax system would fare any better.

Knowledge of price vs. knowledge of environmental outcome

A cap-and-trade system, by its nature, will not give a pre-determined price. Rather, the price it leads to is a function of the environmental ambition imposed through

14 This debate that has filled a vast number of column inches in academic literature and policy advocacy. *Policy Exchange* last weighed into the area in 2010, when it published an essay by Prof Dieter Helm, one of the UK's most prominent carbon tax backers (Helm, 2010). In it (and elsewhere) he argues that the ETS has failed: "the ETS has turned out to be volatile, short-term, and to deliver a low price".

its cap, combined with the cost of the technological options available to reach that cap. A carbon tax would give a definite price. However, the environmental outcome (in other words, the amount of emissions abatement) under a carbon tax system would be unknown in advance.

The task of setting the right carbon price would be no small challenge, and perhaps even more difficult than the negotiated settlements of ETS caps so far. Among carbon tax backers, opinion is vastly divided over what the 'right' price should be, from the low end of $5 (Pielke Jr, 2010, pp. 227–229, Tol, 2008) per tonne of CO_2, to highs of over $100 (Hope, 2011) or €200 (Ekins, 2010, Ev 78). While cap negotiations have been arduous, there has not usually been an order-of-magnitude difference between different countries' positions.

> "Large price swings make it more difficult to plan for the future. While total emissions volumes might matter to governments at the investor level, it is prices that are relevant"

One of the main underpinnings of the case for carbon taxes is the way that the system handles uncertainty and changing information over time. Much of the thinking in this area draws on Weitzman (1974). His insight was that when the marginal benefits of a good (e.g. clean air) are relatively flat compared with the marginal costs, using a price instrument is more efficient than a quantity instrument.

Hepburn (2006) and Helm (Helm, 2012, p. 181), amongst others, use that insight to make the case for carbon taxes, arguing that short-term emissions changes make little difference to the overall stock of GHG in the atmosphere (and thus the effects of climate change), while the costs of decarbonisation are likely to ramp up quickly once 'low-hanging fruit' are picked.

However, as Yarrow points out, the real-world scenario involves information omitted by the Weitzman model adopted by Hepburn and others. "A change in information about future abatement will, via its impact on emissions in future periods, affect the marginal benefits of abatement today...Whilst it may be right... that today's marginal benefit curve is relatively flat, its position cannot be regarded as fixed". This feedback loop means that uncertainties in marginal abatement costs create uncertainties about the time profile of emissions, thus implying uncertainty about the position of the marginal benefits curve in any given period. "Once the effect is recognised, the general result – that taxes are to be preferred to caps – disappears" (Yarrow, 2012).

> *"Suppose that, after the tax rate has been set for this year, there is an upward revision in estimates of how costly it will be to reduce carbon emissions in the future. In the adopted version of the Weitzman model, this will be assumed to have no effect on the initial marginal benefit curve that has been used to set the tax rate. In reality, however, higher costs tomorrow tell us that it would, with hindsight (i.e. after the new information is discovered), have been better than we thought it would be (when setting the tax rate) to have done more today. The marginal benefit of abatement today has, in the event, turned out to be rather higher than anticipated, and the tax has therefore been set at an inappropriately low level. By the same token, a technological breakthrough leading to downward revisions in future abatement costs would tend to imply that today's carbon taxes had been set at too high a level.*

Yarrow argues that cap-and-trade is not inherently superior either, just that the difference between the two is more down to the specific political and economic context than can be extrapolated from general theories.

Price Volatility – Leads to Weak Investment Signal

One of the criticisms of the ETS that often comes up is that the prices it yields are volatile and unpredictable. By setting a limit on emissions and allowing the carbon price to find its own level, cap-and-trade systems inherently accept price volatility. In exchange, they get relative certainty over future levels of emissions. Some analysts believe this is a worrying flaw. Because investors cannot know what future prices are going to be, it is argued, they will under-invest in low-carbon equipment (Environmental Audit Committee, 2010). They argue that to justify investments in long-lasting equipment – particularly of an innovative, and thus more risky, nature – clarity about future prices matters. Large price swings make it more difficult to plan for the future. While total emissions volumes might matter to governments at the investor level, it is prices that are relevant.

Price volatility is a characteristic of the ETS. In normal circumstances, carbon taxes manage price volatility better. However, as an article by Taleb and Blyth argues, policies with this goal in mind can often be counterproductive (Taleb & Blyth, 2011). In theory, a carbon tax regime should replace day-to-day price volatility with environmental outcome volatility – emissions may vary in response to the set price, but the price will remain static. However, a more rigid price structure like this creates the risk of lower probability but higher impact "tail risks". In the case of a carbon tax, the easiest to conceive is the idea that if prices become too unpopular, the entire system gets abandoned; a possibility that is harder for participants to account for than the price volatility in the ETS. Such a possibility also exists in the ETS, and is looking increasingly like a significant medium term risk, but price variability offers a safety-valve that reduces that systemic brittleness.

Innovation

So far most of the cuts brought about by the ETS have been the result, not of technological breakthroughs nor even of investment in long-lived new plant, but of operational decisions such as reducing the use of coal power stations in favour of gas-fired ones. Impact on innovation and investment has been limited, due to the undemanding cap and the relative unimportance of the ETS to investment decisions in comparison to the financial crisis that happened at the same time (Grubb, Laing, Sato, & Comberti, 2012, p. 24).

The ETS does not only affect innovation through its effects on the companies whose emissions it caps. In 2009, the European Commission and the European Investment Bank set up an initiative, known as the New Entrants Reserve (NER-300), to fund innovative energy projects using the proceeds of a special reserve of emissions allowances. However, as Box 7.1 explains, this initiative has also been hindered by the ETS's troubles.

Both through its influence on companies covered by the cap, and in its weakening of add-on initiatives like the NER-300, the problems of too loose and too short-term a cap leading to a low carbon price have consequences beyond Europe. Without technological development the prospects of meeting even

relatively modest global emissions targets, let alone those compatible with the 2°C average rise codified in international treaties, will be unachievable. Yet, because initial lack of ambition combined with the recession, the ETS in its current form will likely not begin to offer these signals until the next phase begins. But, again, these are problems with the way the ETS has been implemented so far – improving the ETS could tackle these issues without needing to start from scratch with a new system.

Box 7.1: NER-300

The NER-300 is a financing programme jointly managed by the European Commission, European Investment Bank and Member States. 300 million allowances have been set aside in the ETS's New Entrants Reserve to fund innovative renewable energy and carbon capture and storage (CCS) projects, to be sold in two tranches running through 2012 and 2013. Allowances will be sold on the carbon market and the money raised will be made available to projects as they operate.

At the launch of the NER-300, when the carbon price was more than €16/tonne, the NER was expected to raise around €4.8bn for these projects. Lower-than-anticipated carbon prices, however, have reduced the pot of money available for them. €1.5bn was raised from the first 200mn allowances (European Investment Bank, 2012). Unless prices rise during 2013, the final 100mn allowances will fetch under £0.5bn more, leaving the pot less than halfway to its intended size.

Linking EU innovation funding to the ETS price has risked ending up in a situation where neither the carbon price itself nor the NER-300 funding pot can act as a significant spur for innovation. This might not be a problem if it meant an ambitious cap was being met with technologies more readily available than had been expected. But, in reality, as we have seen, it reflects a cap with far too much slack failing to motivate change. It also, somewhat ironically, demonstrates another way in which the EU's renewable energy deployment target is undermining innovation in renewable energy technologies, by driving down the value of the funding available for innovative RES projects in order to support the deployment of more mature alternatives. If the EU's carbon capping/pricing policy cannot be rectified, a new source for innovation funding should be found.

A more compelling argument relates to the interaction of carbon pricing policy and innovation. One framing of the ETS (certainly in the absence of other carbon price systems covering most of the world) is that its success can be measured in the technological breakthroughs it enables, to make decarbonisation appealing even in the absence of carbon pricing. Making low- or zero-carbon technologies cheaper than polluting alternatives is hugely challenging and policies to get it to happen have proven elusive (if one accepts the premise that public policy can have a significant effect on that at all, which is at least open to question). Still, in terms of tackling climate change, it is clear that pressure to decarbonise needs to extend beyond the borders of the EU and that making low-carbon technologies more affordable is one of the ways in which this might happen.

Hepburn argues that the price risk inherent in cap-and-trade structures "appears to reduce investment in long-term research and development... Innovating firms already bear substantial technology development risk, and the

addition of price risk reduces their incentives to innovate." (Hepburn, 2006, p. 233). The innovation case for fixing the carbon price is a powerful one. However, attendees from generation firms at the roundtable held to discuss the research for this report said that an improved ETS could deliver a strong enough signal to sustain investment in risky innovative projects such as, for example, carbon capture and storage (CCS) fitted power stations. This would require improvements to the carbon signal through a tighter, longer-term. cap.

Production vs. Consumption

Another way that taxes could expand the comprehensiveness of carbon pricing coverage is by enabling a move towards pricing consumption, rather than production, of GHG emissions. As Europe has cut greenhouse gas production, its consumption of greenhouse gases embedded in products (those imported from overseas as well as those produced locally) has continued to rise (Brinkley & Less, 2010). Moving from a production to a consumption-based measure of carbon pollution would be a major step in international climate policy, requiring a significant retooling of almost every existing anti-carbon policy. That does not necessarily make doing so a bad idea, but it does make it far more difficult to achieve. Either a tax or a cap based on a consumption measure of carbon would be logistically difficult. The argument that carbon taxes are simpler would carry greater weight with an economy-wide policy; though personal carbon allowances do have their advocates, the complexity of such a scheme would be extraordinary (Hillman & Fawcett, 2004, The Carbon Trust, 2010). But even a consumption-based tax faces the same difficulties with imported goods as was outlined in Chapter 4. Fossil fuels produced in the tax jurisdiction and those imported from elsewhere could be taxed relatively straightforwardly (indeed, as Helm points out, many often are, albeit very inconsistently and without regard to carbon content (Helm, 2012, p. 190)). But, for processed or finished products, one would either have to calculate or estimate the carbon content in them. Helm is comfortable with a "rough-and-ready" approach to this problem; how the governments on the receiving end of those guesses will respond is less clear. The precedent set by the aviation debate (see Box 4.1) does not instil much confidence.

Automatic Stabiliser Effect

Cap-and-trade systems respond to a lowering of demand *ceteris paribus* with lower prices. Reducing costs at times of recession has an automatic stabilisation effect, equivalent to an automatic fiscal stimulus. This can lead to the impacts of recession being less damaging.

It can also respond to changes in inflation automatically, without need for adjustment by policymakers.

Political Economy Arguments

ETS Exists

The simplest and among the strongest reasons for persevering with the ETS is that it exists. Transitioning to a carbon tax would entail abandoning all the institutional capabilities, policy experience, industrial and political buy-in that have been achieved so far, in exchange for an untried alternative. Moreover,

the idea of establishing agreement between more than 25 Member States on a harmonised tax regime would not be straightforward, even in benign times. The backdrop of the Eurozone crisis is certainly not that.

Politically, setting the level of a Europe-wide carbon tax poses even greater challenges than agreeing a Europe-wide carbon cap. Many member countries are reluctant to allow tax-setting powers move to Brussels. Expansion of the tax base to all fossil fuels (thus incorporating transport and heating uses) makes the cost of the tax more visible to household consumers, risking further political tension. If one of the main advantages of a carbon tax is that it can be equivalently applied across the economy, it needs to overcome this hurdle. The ETS has avoided this, at least in part, by having an industrial basis that keeps it distant from everyday voters' concerns.

Guaranteeing Competitiveness of Particular Technology/Technologies

Politicians and (especially) industrial firms engaged in the carbon policy debate are often motivated by the desire to see a particular technology or technology type succeed. That may be because they have invested in it, see it as a likely boost for a particular constituency or region, or sometimes for more obscure reasons. Their assessment of carbon pricing policy as a result can be judged on how well it encourages that particular technology. This runs the risk of amounting to winner picking by another name; politicians deciding that the price should be sufficient to result in some particular outcome (deployment of renewable energy sources, coal to gas switching, making carbon capture and storage viable) and then objecting if the price is lower than required to deliver that particular favoured project or technology. With such a motivation, if given the opportunity to set prices rather than quantities, decision-makers may be inclined to set the price higher than needed to accomplish the desirable amount of decarbonisation.

Bureaucracy

A cap-and-trade system is relatively bureaucratic compared to a carbon tax. The ETS has bodies to oversee transactions and permit ownership. As discussed in Chapter 5, it has strong reasons to consider adding a body to handle cap management decisions. The emergence of a financial services market to provide hedging products, while a natural way of dealing with the risk inherent in the market, has only a tangential relationship to the emissions reduction objective at the heart of the policy. (It also creates a constituency, seen in bodies like IETA, the representative group for financial services firms engaged in the carbon market, to lobby for the continuation of emissions trading).

A carbon tax regime should require less bureaucracy, though changing from one system to the other would require firms and governments who have invested in the capabilities to handle the ETS to re-orient all their systems to work with a carbon tax structure.

Susceptibility to Fraud

A series of incidents in 2010 and 2011 brought the security and integrity of the computer databases used to trade emissions permits into doubt. These include the Hungarian government reselling Certified Emissions Reductions that had already been surrendered, VAT fraud, phishing attacks on database passwords and hacking of various accounts including one National Registry (Macken, 2011).

Though the technical aspects of addressing these issues is beyond the scope of this paper, the perception, let alone the actuality, of fraud in the system creates a severe credibility problem for the ETS. As an 'artificial' market, manifested in the trading of electronic certificates without any physical counterpart, it could be fatally undermined if the representative link between the certificates and environmental action were lost, by unauthorised re-use, transfer of ownership credentials, or any of the other activities Macken outlines. With the ETS's political reputation already somewhat fragile, further cases of fraud may increase calls to move to a system that does not create the opportunity for such malfeasance.

Susceptibility to Industry Lobbying

An argument often made to criticise the ETS is that the cap-setting mechanism is subject to such intense "lobbying and capture by vested interests" that the environmental objectives of the scheme are compromised (Helm, 2010, p. 54). Consequently, the cap will be set too high, free permit allocations will be too plentiful, and the resultant price signal will be weak. It is certainly inarguable that the cap setting process to date has been the result of a negotiation between economic cost and environmental objective, rather than being solely addressed at the environmental problem. But the assertions that either a carbon tax will be less susceptible to lobbying than the ETS is, or that such lobbying would not have such severe environmental consequences, seem difficult to justify. In the UK context alone corporate lobbying around tax rates is prominent and often effective, as examples around changes to fuel duty, VAT or oil and gas industry taxation demonstrate. Further, in the case of the UK carbon floor price – the best analogue of all – energy intensive businesses persuaded the government to exempt them. And whereas under a cap-and-trade regime, lobbying for free handouts of permits creates a transfer of resources to the recipients, it does not alter the environmental outcome. However, lobbying for exemption from or lowering of a carbon tax would weaken the environmental outcome. To the extent that a cap-and-trade system's operators are able to shift the lobbying effort away from the cap-setting process and toward the permit-allocation process, it can better guarantee its environmental effectiveness. A carbon tax system lacks this feature (Stavins, 2009, p. 218).

> "If the EU insists that renewable energy targets are a top priority, then a carbon tax system can accommodate them more comfortably than the ETS can"

Further to this is the idea that once a tax is in place (not an easy hurdle to clear in the first place) governments will tend to raise it over time – in the case of carbon taxation thus providing ever stronger incentives to reduce emissions. While this may generally be true, it is not universal. In the UK, the fuel duty escalator, a policy introduced with partly environmental ends that promised ever-rising taxes – has been repeatedly suspended in the face of public unpopularity. Furthermore, if revenues are above all what the government in question seeks, these can be acquired through auctioning of permits in a cap-and-trade system as well as through the direct taxation route.

Helm also makes the argument that the ETS is politically preferred to a tax because the low price it produces does not ruffle any feathers – that "the political

argument in favour of permits over taxes turns out to be little more than an argument against carbon pricing at anything other than a negligible level". While it is clear that there are some groups who would rather pay a low (or no) carbon price than a high one, that does not lead to a preference for carbon taxes over cap-and-trade or vice versa. It seems far-fetched to believe that opposition to carbon price rises under a tightened cap would be quelled with a carbon tax that is equivalently high or higher.

Interaction with other EU Policies

Chapter 6 showed how the ETS has been undermined by other 'complimentary' EU policies, including Directives relating to renewable energy and energy efficiency. This occurs because those regulated sectors of the economy whose emissions are already capped by the ETS. Forcing specific emissions reductions in those sectors (for example by mandating that a certain proportion of electricity be generated from renewable sources) reduces demand for carbon permits, dulling the incentive to make reductions in other ways (say, by switching from coal to gas generation) and lowering the resultant carbon price.

This effect would not occur with a carbon tax structure. Policies such as renewable energy targets would have an additional effect, rather than a substituting for other means of cutting carbon. While, even in the absence of an ETS, renewable energy targets would continue to be a less cost-effective method of cutting carbon, under a carbon tax structure they could at least result in extra emissions reductions, unlike at present.

Another round of renewable energy targets would be a poor use of money when it comes to decarbonising the EU economy. However, if the EU insists that renewable energy targets are a top priority, then a carbon tax system can accommodate them more comfortably than the ETS can.

Interaction with Global Policies

At the moment, there seems to be more widespread global interest in forming regional ETSs than in carbon taxes (see Chapter 4). This may be a result of the existence of the EU ETS or it may be independent of it. Either way, it is possible for the EU to interlink with these other ETSs as they become active.

If this pattern were to change, and a trend towards carbon taxation (either agreed globally through UN negotiations, or in key markets such as the USA, China and India) were to begin, it could make sense for the EU to shift to a carbon tax to enhance compatibility between the systems.

Conclusions

For all the energy that has been spent on the carbon tax vs cap-and-trade argument, the difference between the two is far less stark than the difference between carbon pricing policies and regulatory policies such as renewable energy mandates. But the ETS *exists*, a European carbon tax does not. The practicalities of the matter come down to the question – is it easier to reform the ETS or to scrap it and start again? What the ETS has accomplished so far is not to be treated lightly. It has created a single, continent-wide carbon price that has broad acceptance in the industrial, financial, and government sectors. Re-opening questions about whether the ETS should exist seems a poor use of the momentum it has achieved so far, especially

when options to further improve the ETS remain to be applied. The learning experience that policymakers have from three phases of the ETS would be lost were the ETS to be abandoned, and a whole new set of trial and improvement needed to be undergone if politicians decided to move to a carbon tax.

In fact, most of the problems supporters of carbon tax identify are not problems with cap-and-trade in comparison with carbon taxes, but of carbon pricing in a world where political commitment to the concept as a whole is fragile. It seems, implicitly and sometimes explicitly, to assume that a carbon tax system will deliver a higher carbon price than an emissions trading system for the same expenditure of 'political capital' or effort. However, ultimately, if political will is lacking, neither a stronger carbon cap in the ETS nor a usefully high carbon tax is going to materialise. To return to the quotation that began this Chapter, if "the ETS has turned out to be volatile, short-term, and to deliver a low price," why not find ways to make it less volatile and short-term, rather than insisting that we start again from the beginning? Chapter 4 discussed options for giving the ETS a longer-term signal, and Chapter 5 options for managing the cap, which should moderate volatility. However, while it seems probable that the options outlined in those two Chapters would raise the price in the ETS, *so long as the cap is sufficiently strong*, it should be free to generate whatever price the market determines is the right level. Higher prices may well be the outcome, but there is no need to force them to be.

The points raised in this Chapter show, in part, that the difference between carbon tax and cap-and-trade solutions can sometimes be overstated. There are obvious and major differences between the systems but the advantages of a carbon pricing system (using either arrangement) are far superior to the alternative, regulatory approach. The risk is that arguments between proponents of carbon tax or cap-and-trade end up weakening the case for carbon pricing in general, and end up leading the EU (and others) to a more expensive, less effective regime where politicians and officials, rather than market forces, make the decisions about how carbon emissions should be reduced.

Recommendation

Problems with the ETS must be recognised and addressed. However, the need to improve the ETS should not be conflated with a need to abandon it. A policy this complex and extensive is never going to alight on the perfect approach right away. Even as knowledge of how the ETS operates increases, it would be naïve to expect a perfect solution. The need for climate policy to adapt and learn will be a continuous process.

- **Policymakers should ensure that a carbon pricing system remains the main driver of emissions reduction in Europe.** Arguments between backers of cap-and-trade and carbon tax systems should not allow their policy debates to provide an argument for moving away from either system to a less market-based system. There is far less to choose between carbon taxation and cap-and-trade than there is between those two market-oriented approaches and the regulation-based alternatives. Ensuring climate policy is as cost-effective as possible is imperative if emissions reduction objectives are to be achieved – either of the carbon pricing models discussed in this Chapter perform far better than other options on that basis.

There are a limited number of cases in which a move to carbon taxation from emissions trading would make sense. They are:

- If other major economies adopted tax-based policies. At time of writing, that does not appear to be on the cards (indeed, China is moving forward with experimental regional ETSs), but a change in the political mood in the USA or China would be important enough that Europe should be prepared to reconsider its approach.
- If international agreements changed to accounting for carbon on a consumption, rather than production, basis. Europe going alone down that path will create huge complications, but if a strong consensus emerges internationally that this approach is preferable, then Europe should be willing to adapt its approach.
- If the ETS is abandoned. In this case, a carbon tax would be preferable to command-and-control regulatory alternatives.

However, absent these, or other even less probable developments, European policymakers' focus should be on reforming and improving the ETS they have.

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